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H. D. SANKALIA

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INDIAN ARCHAEOLOGY TODAY
H.D. SANKALIA

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TO

MY WIFE

PREFACE

A part of this book was published in 1964 on behalf of the Heras Institute, St. Xaviers, College, Bombay and some booksellers told me that it soon sold out, because it was found useful not only by students, but even tourists, as it enabled them to know, at a glance, what India had done, during the last century, to know her past.

This revised and enlarged edition is mainly concerned with a decade and a half—1962-1978. It sketches some of the most important contributions in several fields of archaeology in India and on her borders, particularly on the North-West.

However, this account does not claim to be an exhaustive one for two reasons. First, it is difficult to get information about what is happening in the sub-continent. Secondly, *Indian Archaëology—A Review*, an excellent publication of the Archaeological Survey of India, does not appear regularly. Its latest number covers the discoveries made known upto 1973-74. Thus there is a gap of nearly five years. This was difficult to fill up. Whatever information the readers might find pertaining to this period is due to the kindness of my friends and former pupils in the Archaeological Survey of India, State Departments of Archaeology and Universities.

A few features of Indian Archaeology during the last 15 years may be highlighted. Though there is an appreciable fall in the collection of material by the States and Centre, because village to village survey has been given up, there is a welcome attention to the {scientific collection of evidence, and its study in the same way. Although, at present, this is confined to a few institutions, yet it is the most desirable change. How this may be done, I had occasion to point out in Dr. D.N. Majumdar Memorial Lectures, entitled *New Archaeology, Its scope and application in India.* Both in prehistory as well as in historic archaeology, scholars have begun to look beyond their nose, and inquire about the ecological background, and above all, the function or purpose for which a tool or a temple was created.

There is also a renewed interest, nay spurt, to prove or disprove the truth about our epics, the *Ramayana* and the *Mahabharata*. This interest was raised to a feverish-pitch by the Press and the Radio, as these were starved for other news during the Emergency.

Publishers have shown unusual, nay daring interest, in republishing century-old classics, as well as publishing some new ones. However, their eye is on the foreign market. Hence, Indian readers do not gain much.

The collectors, particularly foreign, have shown unusual interest in our monuments. This has encouraged *vandalism*. If the nation does not guard against this most heinous crime, the posterity will have nothing much to see and admire.

Pollution also adds its share. Already, the famous temple at Belur has suffered and the Taj is threatened.

While bringing out this book, it was thought desirable to include certain portions of the first edition, for these very well explain the (then) new trends, new methods, and new scientific methods of dating the past. These hold good even today, though these are being constantly revised and brought up to date.

These "improvements" have been cited, and brief notes added, to make the account up to date.

Again, several sections in the new edition, particularly in prehistory and protohistory, anticipate what had been done in these past two decades. Few (new) readers might have known these. Hence, with a view to appreciating what is being done today, and what might be done in the next 10 years, these sections have been retained.

However, in the section on historical archaeology all the old matter has been dropped, primarily because it dealt with some outstanding discoveries in sculptures and epigraphy and not with any general principle.

Thus this edition has four parts:

Part I reviews the position of archaeology in India from 1871-1939.
Part II reviews the position of archaeology in India between 1939-1961.
Part III sketches the new developments between 1961-1978 (up-to-date).
Part IV gives a Blue-print for Indian archaeology for the next 10 years.

Part IV lays particular emphasis on a planned excavation of a city-site, inter-disciplinary approach and execution. Such an organized and dedicated work alone will contribute to real knowledge. This is exemplified by a detailed summary of the Italian excavation and report of the 5,000-year old city site of Shahr-i-Sokhta in Iranian Sistan. This, however, does not form part of the main text, but is given in the Appendix.

Since the book deals with diverse topics, the various illustrations, selected after great care, either because of their rarity, or uniqueness, or because they add to our knowledge, have been grouped section-wise, and it is in the fitness of things and hoped that those have been included as near to the topic as possible, instead of being put anywhere, as the modern fashion is.

22nd August 1979.
Poona.

H.D. Sankalia

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Poona,
August, 1979

H.D. SANKALIA

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SPECIAL ACKNOWLEDGEMENT

In the very recent seminar on the Harappan Culture held at Srinagar, Kashmir by the American Institute of Indian Studies at New Delhi, Dr. J.F. Jarriage read a very important paper (21-6) on his latest excavations at Mehrgarh (Baluchistan). This excavation has a great bearing on the origins of civilization in the Indian sub-continent. Hence a brief extract is here published with a profound sense of gratitude to Dr. Jarriage and the American Institute, and to my colleague Dr. M.K. Dhavalikar who kindly lent me his copy of the papers read at the Seminar.

I am also grateful to Shri S. Balwant for withholding the publication of the book and including this information as a Special Foreword.

FOREWORD

There can be no better Foreword than this latest information on the origins of civilization in the Indian sub-continent, provided by the excavation of Dr. J.F. Jarriage at Mehrgarh, Baluchistan during the last three years.

Though a number of sites in Baluchistan had given very tantalizing evidence of several cultures preceding the Indus or the Harappan Civilization, all these were based on very small excavations, simply vertical digs and hence not at all useful for understanding the origins of several aspects of human culture, such as the beginning of agriculture, domestication of animals, and plants, making of pottery, houses of mud-brick, and trade and commerce. On all these questions the large, horizontal excavations have thrown important light.

Mehrgarh is situated at the foot of the Bolan Pass in the Kachi Plain. This river Kachi indeed belongs to the Indus system. The site covers an area of 500 acres. Here horizontal excavations were undertaken in 1974 by a French Expedition under Dr. J.F. Jarriage. These excavations have yielded evidence of a contiuous settlement for nearly 3000 years before the rise of the Indus civilization in about 2500 B.C. This long cultural tradition has its own regional characteristics. The Neolithic deposit is more than 30 feet (10 meters) thick. The top of the Neolithic settlement is dated c. 5000 B.C., and it goes back to the 6000-7000 B.C.

The lowest layer is aceramic, that is without pottery. Still it contained mud-brick structures. On these mud walls were seen impressions of cultivated barley. Though the lowest layers included bones of wild animals, the upper ones revealed bones of domesticated animals.

Along with this evidence of agriculture and domestication of animals were found microliths. Within the intermediate layers were found several human skeletons with baskets coated with bitumen, polished stone axes, stone vessels and microliths. There were also cakes of red ochre, and ornaments or turquoise, lapis-lazuli, and carnelian. Still, with all these there was no pottery.

Then only in the top layer of the Neolithic settlement were found a few potsherds which contained chaff.

South of the Neolithic settlement were found the remains of an occupation which is dated to the 5th millennium. B.C. Here so far a 10-room building has been exposed. Since the rooms are very small, it appears that this building was a store-house. Possibly here were stored wheat and barley, as imprints of these were found, as well as two complete sickles. A *chulah* (fire-place) contained hundreds of charred seeds of cotton. There was a workshop for working in steatite, which contained hundreds of bone owls. (Similar workshop was found by us at Nasik in 1950). There were also crucibles for smelting copper.

In Period III Mehrgarh along with Mundigak in Afghanistan and Namazga III in the Turkmenia became a part of a very large interaction, producing mainly potteries and figurines.

At this time was founded Shahr-i-Sokhta in Sistan (See Appendix I).

Then the beginnings of unbanization are witnessed in the neighbouring Rahman Dheri with remains of large monumental buildings.

At the very top is found pottery of the Kot Diji type, Then (for some reason) the site is abandoned. A large Harappan site is found near the village of Nowsharo.

Thus the Kachi Plain becomes a part of the Harappan territory.

We can thus understand that the Indus civilization did not suddenly crop up. Behind it there were three to four centuries of cultural development when man in Baluchistan learnt gradually the art of pottery-making. But before he mastered this, he grew first barley and then wheat and also domesticated animals. All this time his main tools were tiny stone chips (microliths). Then came the astounding discovery of cotton. There was also "industrialization" as evidenced by ornaments of lapilazuli and turquoise, both imported from Afghanistan. Grinding or polishing of large stone tools came soon after. Copper was also smelted in about 3500 B.C.

Thus some of the fundamental aspects of material culture had come into existence between 7000 and 3500 B.C. in the Kachi Plain. What was needed was some efficient orgnizer who would utilize all these and build a city like Harappa or Mohenjodaro and then spread its influence far and wide. Where was this orgnizer born—in Sind. Baluchistan, Punjab or Afghanistan or in the Sarasvati valley?

PART I

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Brief Review of Aims, Methods and Work (1861-1939)

Though the Department of Archaeology is nearly 100 years old, interest in all old things goes back to the year 1784, when Sir William Jones founded the Asiatic Society in Calcutta with the express purpose of enquiring, among other things "into History and the Antiquities...of Asia." This was followed by a series of pioneering works by H.T. Colebrooke, Charles Wilkinson, H.H. Wilson, Charles Warre Malet, William Erskine, Salt, Collin Mackenzie and finally Francis Buchanan on epigraphy, the antiquity of Afghanistan, the caves of Ellora, Kanheri and Elephanta, and the antiquities of Mysore, Bihar and Bengal respectively.

In spite of so much good work, there came an interlude. This was relieved by a short interval when James Princep became the Secretary of the Asiatic Society in 1833 and within three years deciphered the *Brahmi* and *Kharosthi* scripts. Thus were opened the gates of the sources—then known and for nearly a hundred years to come—of ancient Indian history and culture.

However, from 1861 until now, barring a few exceptions, archaeology has remained a Government preserve. Therefore, while reviewing the aims and methods during the past century and the first half of this century, one has perforce to say what actuated the policy of the persons in charge of archaeology.

This long period broadly falls into three divisions as follows : (i) 1861-1902; (ii) 1902-44; and (iii) 1944-60.

Archaeology had a very chequered career in the first period. Twice or thrice the Department (the Archaeological Survery of India, as it was then called), first founded in 1861, was disbanded or severely retrenched. Three personalites—General Alexander Cunningham, James Burgess, and Fergusson—figure prominently during this period in the field of archaeology, as it was then understood, and three or four in that of

epigraphy: viz. J.F. Fleet, Bühler, Bhagwanlal Indraji, and E. Hultzsch, names which are familiar to all those who turn the pages of *Epigraphia Indica* and the *Indian Antiquary*.

Cunningham had taken the *Travels of Hiuen Tsiang* (Yuan Chwang) as one of his guides. Hiuen Tsiang was a Buddhist pilgrim who had expressly undertaken an arduous and hazardous journey to India to visit the famous Buddhist places of pilgrimage and other Buddhist centers. Therefore, though a large number of sites in Northern and Central India—in the Punjab, U.P., Rajputana and Central India and the former Central Provinces and parts of Bihar and Bengal—were surveyed on foot, horseback and bullock cart, in days when travelling was much more difficult than today, the one dominant idea that guided this early pioneering work is the discovery of Buddhist monuments.

After Cunningham, the Department was reconstituted, eliminating the co-ordinating authority of the Director-General. Fortunately James Burgess was left in charge of the work in Western India. Burgess was by profession and aptitude an architect. And all surface monuments, of any architectural importance, were most carefully drawn, photographed and fully described by him in several reports. Thus was laid the foundation of monumental archaeology in Western and Southern India. If we know anything of the caves and temples of the early dynasties like the Satavahanas, Chalukyas, Rastrakutas, the Pallavas and the later Western Chalukyas of Kalyan and Hoysalas, the credit goes to Burgess and his assistants.

When Burgess left, he recommended a partial dissolution of the Department that he had built up. Chaos and confusion ruled the land, from which it was rescued by the vision and foresight, coupled with strength and vigour, of Lord Curzon. In his minute of 1900 he defined the aims of the Department which he was to refound:

"It is, in my judgement, equally our duty to dig and discover, to classify, reproduce and describe, to copy and decipher and to cherish and conserve."

This done, John Marshall, who had just completed his training in Crete, Greece and Turkey, was invited to become the first Director-General of Archaeology in India. This was a most happy choice. In him the country found as ardent and forceful champion of archaeology as Curzon. His plea for the retention of the Archaeological Survey, soon after he took charge (1904), has indeed become memorable and deserves to be engraved in letters of gold for guidance, whenever, in times of depression or otherwise, Government wish to abrogate their duty and close down the Department.

"I may refer at the outset to an illusory belief to which expression has often been given that a time would soon come when the Archaeological Survey might be disbanded and the work of conservation, if not complete, accomplished through the agency of the Public Works Department. That time has receded further year after year, and the phantom might now, once for all, be laid to rest...The work of archaeological officers is of a kind which cannot be discharged by any other existing agency and it can only cease if the Government cease to admit their responsibility for the preservation of the ancient remains of the country."

As far as the discovery of the past things was concerned, it received a slightly different direction. Marshall had his training in classical Greek archaeology. Naturally

he was interested in discovering Greek elements in Indian culture. However, this was not his sole passion. India was divided into several "circles" and each "circle" was instructed to carry out conservation of typical and important monuments and discovery of new ones. Excavation of a few important sites was also undertaken. The epigraphical branch was also reconstituted. Thus for nearly 30 years—from 1904 to 1934—Marshall guided the policy of the Archaeological Survey of India. Some of the Indian States—like Mysore, Travancore, Jaipur and Baroda—also instituted such Departments following the model set by the Government of India.

The archaeological work during the second period may be grouped into two phases: (i) 1904-1920 ; and (ii) 1921-1934.

The first phase was interrupted by the war for a few years ; but nevertheless, during its short span, scores of inscriptions and religious monuments of several faiths in India were discovered, and a number of sites excavated, principally in Northern India, of which Taxila ranks first and Nalanda second, others in importance being Sanchi, Sarnath, Bhita, etc.

These discoveries in the field of epigraphy and monuments have provided the basis for writing several chapters in the political, social, cultural and art history of India, *but not a continuous history of the origin of man and his development through the ages*, or as the anthropologists would put it "the progress of man from Savagery and Barbarism to Civilization." This was due mainly to two reasons. First the aim of archaeology—not only in India, but the world in general—was to find objects which would fill the museum cases, and tell us something about the past. Secondly, it was presumed (though wrongly) that Indian history and culture began with Asoka, and was, thus, not older than the third century before Christ. Naturally all the efforts were concentrated towards unravelling India's past since then. However, the aim was limited ; save Taxila which was excavated continuously and extensively for a number of years, no site in India was excavated which tells us of the life of the people at any stage in Indian history. India, dominated by religion, was thought fit to know about its religious monuments only. Thus, it was first the Buddhist, then the Brahmanic, Jaina and Islamic monuments which constituted the chief archaeological wealth of the country, and figured prominently in the Archaeological Reports and formed the main content of the syllabi in Universities.

The chance discovery of Mohenjodaro and the re-discovery of Harappa (which was first discovered by Cunningham) to *some extent* helped reshape the policy and aim of the Archaeological Survey. Existence of identical civilizations at a distance of 400 miles naturally led scholars to ponder over the cause of its spread or distribution and origin, though the latter was not investigated at the original type-sites by having deep excavations, right up to the virgin soil. An excellent opportunity was thus lost of knowing the beginnings of civilization in the Indus Valley. But this was compensated for by the knowledge of the civilization itself—a thing which might not have been possible, had the efforts been directed towards its origins. To trace its extent Sir Aurel Stein undertook several exploratory tours in Baluchistan and the Indo—(now Pakistan)—Iranian borderland, and the late N.G. Majumdar explored Sind. These were the first projects which were conceived and undertaken for understanding a particular problem in Indian archaeology. The aim was not to discover *any* ancient object that might be

there. It was about this time, 1935, that Cambridge University and the University of Yale co-operated and worked in the Kashmir Valley and the foothills of the Punjab to discover human cultures in association with Ice Ages.

Man was after all not only 2,300 years old in India. If India boasted of a civilization some 5,000 years ago, then naturally it should have a beginning. The bounds of archaeology in India were thus widening. Poor potsherds and rude stone tools, besides splendid works of art, were beginning to draw the attention of the official archaeologists, though archaeologists in the past century and amateurs in the early thirties had done splendid work in Madras, and the former Baroda State, Kurnool, Bombay and the Punjab.

The official outlook, however, still remained comparatively closed. All the Europeans—mostly British officers—had left, and Rao Bahadur K.N. Dikshit was in charge of the Archaeological Survey as the Director-General of Archaeological Department—one of the largest in the world—had not done so well in its life of 30 years, in the matter of conservation as well as excavation. Sir Leonard Woolley, the famous excavator of the Royal Graves of Ur and many other sites in Western Asia, was invited to suggest remedies for improvement. Then came the war.

New Aims and Methods

Archaeological work, particularly excavation, was much restricted, because of the strong adverse comments of Sir Leonard Woolley. Only the Director-General, according to him, was competent to carry out a scientific excavation, and he recommended that attention be now turned to Ahichchhatra, a site in the Gangetic Valley, for knowing the evolution of Indian Culture.

It was at this time that the Deccan College had been re-opend as an Institute for post-graduate studies and research in History and Linguistics. A professor there had submitted to Rao Bahadur Dikshit certain schemes for exploration. While working with very limited means, and in a very narrow geographical sphere, viz. Poona District, certain megalithic monuments were discovered near Poona. These had been completely neglected, because they were architecturally of no use, much less beautiful. But it was forgotten or not realised that these rude stone monuments enshrined a particular stage in man's cultural development. For it was the aim of the Department, called the Proto-Indian and Ancient Indian History Department, to search for links between ancient Indian history and proto-Indian history on the one hand and between proto-Indian and prehistory on the other, so that a continuous history of man's past in India can be had.

Rao Bahadur Dikshit was not slow to realize the importance of this discovery. It was not indeed very significant, but it led to what is now called a "chain reaction", and was responsible for determining the future lines of work in the Deccan College and in India.

Co-operation Between Government and Research Institutions

Rao Bahadur Dikshit and I had independently suggested that the problem posed by Robert Bruce Foote of a hiatus between the Palaeolithic and Neolithic Ages, after his

pioneering work in Gujarat in the last century, be taken up for investigation. This he now asked the Deccan College and the Gujarat Research Society to undertake with the help and co-operation of the Government of India. This was a landmark in the development of Indian archaeology in two ways. For the first time explorations, followed by small excavations, were to be undertaken with the sole aim of attempting to solve a problem. It was indeed a very important problem. What had happened to man in Gujarat some 2,00,000 years ago? Did he leave the region all of a sudden without leaving any traces owing to certain climatic reasons, or did he gradually step into a food-producing stage, known as Neolithic?

Secondly, it was the first time that the Government of India had come down from its ivory tower and sponsored archaeological work in co-operation with a private society and a provincial Research Institute. About the same year the University of Calcutta was granted a licence to excavate at Bangarh in Bengal. This was a very small beginning and was symbolic of the change—a revolution—that was to follow very soon, both in the outlook—the agencies that were to carry it out.

But, perhaps, after an existence of nearly 40 years, this was probably a very slow, halting step. Some dynamic action was necessary to remould archaeology in India. This was achieved by Dr. (now Sir) Mortimer Wheeler. Wheeler was endowed with a unique combination of theoretical and practical training, varied experience of archaeological work, military discipline and an innate sense of planning. Within a couple of months of his arrival he realized that Indian archaeology had suffered from a lop-sided development. A few Buddhist sites in Northern India had received all the attention, the South was completely neglected (because of its hot climate!). Nor was there any fixed point in its chronology before the 4th-5th century A.D., because there were no dated inscriptions or any other reliable source of information by which one could understand the sequence of events backward in South Indian history.

However, the first essential was a trained body of workers. So far archaeological excavation was a closed book to students in Indian Universities. Wheeler opened this. Actually he wrote to the Vice-Chancellors of various Universities to depute students for training in the excavations camp at Taxila, Arikamedu and Brahmagiri. And just to encourage them, and help them while they were receiving training there, he paid them their living expenses or small stipends[1]. Happily this practice is continued by Sir Mortimer's successors, and by institutions which conduct excavations.

"Time-Table" of Cultures

Why did Wheeler insist on a "time-table", as he so aptly and beautifully called the pressing need in archaeology? Why was it not thought of before?

The reason is very simple. Formerly the aim of the archaeologist was to get any old, ancient, artistic object which would satisfy the curiosity of the layman, and the connoisseur of art. None of them cared a bit about how man and his culture had

1 Both these practices were advocated by the writer when he returned from England after having had training under Dr. Wheeler in an article which the *Illustrated Weekly of India* called "Archaeology for the Masses," March 1938.

evolved. But if you want to trace the development or evolution of any thing, whether it be a man, or a flower or a tree, or a work produced by man, you must see the various steps which had to be crossed to reach a particular stage. To take a concrete instance, in South Indian history (because we had already a hazy notion of things in North India about Asoka, Chandragupta, Buddha, etc.) when was it that the people erected huge megalithic tombs of which South India had hundreds? Were they prehistoric, as it was universally believed before Wheeler, or later? These should be so excavated that they provided a link with something known, Wheeler was conversant with Roman antiquities and so he set about looking for these, if they were there. In a visit to Pondicherry he saw Roman *amphorae* and Arretine pottery, so he dug at Arikamedu[2]. This provided a fixed datum line for knowing what things India made and what she imported in the first century B.C.—A.D. The next step was taken at Brahmagiri and Chandravalli, where objects contemporary to and earlier and later than those found at Arikamedu were found. A rough time-table of cultures was ready for the Southern, Western and Southeastern India. It was based on the principle "proceed from known to unknown."

Importance of Pottery

Pottery which is rarely found in complete form, played an important part in building up this sequence of cultures. It had been completely neglected earlier. Slightly noticed in the extensive work at Taxila, it had received full attention at Mohenjodaro and Harappa. This led to pottery-hunting of similar type, fabric and design by Aurel Stein and Majumdar in Baluchistan and Sind respectively. However, pottery of the historical period had not found a place in archaeological reports, save very perfunctorily. By the discovery and recognition of the Northern Black Polished Pottery (NBP), then the imported Mediterranean Arretine ware and the *amphorae*, and the association of a fine black-topped and red-bottomed pottery called the Black-and-Red Ware, and a pottery with a glossy yellowish-reddish tinge with criss-cross painting on it, a *corpus* of Indian pottery forms and fabrics began to be built up.

What were coins and inscriptions to the earlier archaeologists, pottery and palaeoliths are to their present day successors. Both the latter are more trustworthy as indicative of past cultures than coins and inscriptions, for the coins can migrate very easily, whereas the inscriptions may relate only to the written form of letters, and the donor, his family, etc. But pottery belongs to the place and the people or is definitely imported. Once baked in fire, it is almost imperishable and studied intelligently will reveal an important aspect of the life of the people who made it.

So for detecting past buried cultures and their sites, there is nothing so valuable as pottery.

After recognizing a pottery form and fabric, even from its fragments, called "potsherd", as characteristic of a particular period and region, the archaeologist goes about looking for similar forms and fabrics. This is called "exploration".

2 This has been vividly described by him in *Rome Beyond the Imperial Frontiers*, London, 1954, p. v. (preface).

Distribution Maps

The sites which yield similar type are plotted on a map (Fig. 1). These maps tell us about the range of the culture, as indicated by a particular type of pottery. Thus the NBP is primarily confined to the Gangetic Valley, having come into existence about the 6th-5th century B.C. Buddhist *Bhiksus* took it to far off places during their peregrinations, and so occasionally sherds are found as far south-west as in Nevasa, Nasik and Kolhapur ; or south as in Amaravati on the Krishna; west as far as Somnath; east as far as Gaur and Pandua in East Bengal; in north in Taxila and Charsada, and as far as Udigram in the Swat Valley in Afghanistan.

Distribution maps have thus come into vogue. These can be for anything, not necessarily pottery. A look at the distribution map not only reveals the extent of a particular artifact, but makes us think if the objects are from far too distant regions, such as India and Europe, or India, Egypt and South-East Asia; and urges us to seek for an explanation of identical forms in such far-flung places and for the agencies which contributed in their transmission.

Palaeoliths

Above a reference was also made to palaeoliths. "*Palaeo*" means "old", and "*lithos*" stands for "stone" i.e. an "old stone,' and connotes in archaeology an Early or old Stone Age tool, made by man thousands of years ago. Our experience tells us that such tools are not made today except in France where. such things are in great demand by wealthy tourists and a business in faked tools has grown up). Further, when they are found in a particular geological context, the tools indicate their age in a fairly certain manner. So after our work in Gujarat in 1941-42 in the valleys of the Sabarmati, Orsang and others, similar search was started in the Godavari and its tributaries in Maharashtra. But to our surprise the tools found were of a different nature and rock, the significance of which could not be immediately understood. Then once again such tools were found at Nevasa, Ahmadnagar District, in 1954 in the bed of the Pravara, along with much older types of tools of an earlier age. So it dawned upon us that these new types of tools belonged to another—a later Stone Age. And since then such tools are being reported by explorers from several parts of India. The distribution maps reveal that this Stone Age was almost co-extensive geographically with that of the first. Further studies might bring to light its relation with similar Stone Age Culture in Africa.

Thus the past decade or generation may rightly be called "the Age of Pottery and Palaeoliths".

These distribution maps when related to geography further give us an insight into the environment in which man lived or alternatively to the physical barriers which an emergent culture, that is the people bearing it, had to face, or the factors which facilitated its spread.

Stratigraphical Method of Digging

With the reorientation in our aims and objects, the means for realizing these have necessarily changed. I have mentioned some of the newer techniques. These were already known and practised in Europe, at least a generation earlier, but as the anthropologists say, for introducing them into India, new cultural or other forces were necessary. However, the West had in the meantime still marched ahead. Archaeolegists and geologists have been trying to discover better and more exact means of dating the past. So, when the archaeologists working in Western Asia were relying on written evidence like coins, seals and inscriptions, or various building levels, or failing both these, on stylistic evidence, Wheeler introduced the stratigraphic method in our excavations, and the three dimensional system of recording the finds.[3] In other words, it is nothing but the principle of superposition of layers which are to be carefully observed and recorded while conducting an excavation. It is an extension of the geological method into archaeology. When the objects are not only noted according to their depth, but their exact position in space is further recorded by noting their position from a fixed point, it is possible to prepare an exact plan of where the objects were when they were excavated (Figures 2, and 2b).

Though comparatively more exact, the stratigraphic method is certainly very expensive and time consuming, and at best indicates a relative sequence of events. Wheeler himself has suggested certain modifications[4] in its application in a country like India and on a site like Mohenjodaro, in a brilliant lecture entitled "What Matters in Archaeology?".

So the search for more exacting method for dating the past was on. For, every one is curious to know the antiquity of an object he has found, whether he is a scientist or a layman. It is a common human instinct. While the geologists, astronomers and others were playing with various methods since the last century, an admirable

3 See *Ancient India*, No. 3, 1947, pp. 43-50 and Wheeler, Sir Mortimer, *Archaeology from the Earth*, Oxford, 1954.

4 After fully condemning the methods adopted by the excavators of Mohenjodaro, Wheeler makes a very pertinent remark. He says that, granted their methods were bad and unscientific, without a large-scale excavation of that nature, the great Indus Civilization—with its houses and well-aligned streets—would never have been laid bare before the world. While archaeologists like himself, following the stratigraphical method of excavation first introduced by General Pitt-Rivers in England as far back as 1880, would have at best given an idea of the evolution of cultures at Mohenjodaro by relating the various pottery types and seals, for instance, to a careful observation of the layers, they would have produced an adequately documented Indus Valley Culture, but missed the Indus Civilization. And what after all *matters* to archaeologists as to layman alike is an insight into the life of the past, its *complete re-creation*, as far as possible, before our eyes. It is therefore necessary, as Sir Mortimer says, to have something like selective stratification on great sites like Mohenjodaro, and not a slavish imitation of Pitt-Rivers, which the latter himself would have adopted. It is all right for small sites which hardly yield 10 potsherds in an entire excavation.

The entire lecture is worth reading. See Wheeler, R.E.M., "What Matters in Archaeolegy?", *Antiquity*, Vol. XXIV, 1950, pp. 122-30.

account of which you will find in Professor Zeuner's *Dating the Past*,[5] the physicists developed a more exact method. It is indeed an offshoot of the atomic explosion studies which has developed since the conclusion of the last war, and is due to Willard F. Libby, working as nuclear chemist at the University of Chicago's Institute for Nuclear Studies.

Carbon-14 or C-14 Method of Dating

The carbon-14 method, very briefly and in simple words[6], is based on the discovery that vegetation—trees, plants, flowers—absorbs, carbon dioxide, which contains carbon-14. Our atmosphere is full of this and the process goes on every minute. The cosmic rays bombard the upper atmosphere. This produces, fast-moving neutrons. Neutrons collide with atmospheric nitrogen atoms, producing tiny amounts of carbon-14 and hydrogen. Finally carbon-14 combines with oxygen to become carbon-dioxide.

When animals feed on vegetation they add carbon-14 to their bodies. But when plants and animals die, carbon-14 disintegrates and reverts slowly to nitrogen. (Fig 3)

It is indeed remarkable and useful to archaeology that all living organisms contain the same proportion[7] of carbon-14. And after death organic materials lose their carbon-14 at the same rate. It is calculated that half disappears in 5,568 years, a half life. Three-fourths dissipates in two half lives, and so on. When, therefore, the radioactivity of modern carbon is compared with radioactivity in ancient carbon, either from charred grains, wood, bone or shells, it tells us the amount of time that has elapsed since death (of the sample examined). It has thus become possible to calculate in almost exact years the date of the site, or building, which yielded the sample. The earliest date—58000 B.C.—so far is of a piece of wood unearthed at Amersfoort in the Netherlands which, however, does not prove the existence of man. Earlier C-14 dates for the existence of man, viz., 35000 B.C. and 32000 B.C. respectively, have been given by charcoal from Texas, North America and the Shanidar Cave in Iraq. The first agricultural village of Jarmo in north Iraq goes back to 7000 B.C., though earlier still is Jericho in Palestine. In India, so far, we have got four C-14 dates for the Chalcolithic village of Navdatoli on the Narmada in Central India, ranging between 1700 B.C.—1100 B.C., for the sites of Utnoor and Pikhlial in Andhra Pradesh, and for Kot Diji, an early Harappan site in the former Bhawalpur State in Pakistan. The last date shows that the typological dating of the Indus Civilization to about 2500 B.C. was right.

5 Several editions of this most useful work have since been published since its first appearance in 1946.

6 Adapted from *National Geographic Magazine*, August 1958, pp. 234-55. The article "How Old is It" is very instructive.

7 This assumption has recently been questioned in "The 1959 Carbon-14 Symposium at Gröningen". Of this Professor H. T. Waterbolk has given a very useful summary in *Antiquity*, XXXIV, 1960, pp. 14-18, from which the relevant extracts are quoted :

Archaeo-Magnetism

Other methods are also being tried. One of these is called "archaeo-magnetism or remnant magnetism".[8] It is based on the principle that many rocks—that is, stones and natural clays—contain oxides of iron and are feebly but appreciably magnetic. And it has been found that remains of ancient kilns, hearths and burnt structures do preserve their magnetization. This can be measured and compared with the direction of the earth's field at present. In this way a graph might be prepared for nearly 2,000 years, and thus date a particular object within a quarter of a century.[9]

Thermoluminiscence

Two new archaeological dating methods[10] now enable scientists to date objects 60,000 years farther back in time than they have been able to do before.[10a]

One records the electron glow of dishes, vases and other pottery when heated; the other measures moisture layers in objects made of volcanic glass.

All materials contain traces of radioactive elements, which emit radiation that traps electrons in solid crystals at ordinary temperatures. As this process progresses, the number of trapped electrons increases.

Doctors George C. Kennedy and Leon Knopoff of the University of California Institute of Geophysics, Los Angeles heated pottery and lava rock to about 800°F. At this point trapped electrons are released and they create a glow called thermoluminiscence.

This glow is so faint that it is not visible, but it can be detected and measured by a photomultiplier tube. The more light emitted, the greater the length of time since the material was last heated to a temperature where it could give off electrons. In the case of a piece of pottery this would probably be when first fired or when last used in a hot fire.

The thermoluminiscence technique can date objects up to about 100,000 years old. It has been used to date 15,000-year-old lava rock from Arizona and ancient Greek pottery from the ninth century B.C, or about the time when Homer was writing the *Iliad*.

This dating method will be especially valuable in establishing dates and time sequences for prehistoric societies that have left no materials containing carbon, such as charcoal or wood, which can be dated by the radioactive carbon method.

It will also help to establish the correct chronology of varying styles and shapes of pottery. Archaeologists most commonly use a comparative dating method by considering such things as development of craftsmanship, decoration and design. The thermoluminiscence technique can now be used to verify or correct the archaeologist's chronology. It is expected to be used next in dating Mayan and Mexican pottery.

8 R. M. Cook and J. C. Belshé, "Archaeomagnetism : A Preliminary Report on Britain", *Antiquity*, Vol. XXXII, 1958, pp. 167-78.

9 This method is still at an experimental stage.

10 *Science Digest*, Aug. 1960. p. 35. 11a For another method *see* p. 24.

This method will have great scope in India where several regional and sub-regional cultures based solely on pottery have recently been unearthed, but their exact age is not known.

Aerial Photography

Methods of detecting the site hidden from view have also been developed. Aerial photography has been practised since the first world war in England, Europe and Western Asia. In India aerial photographs are taken of sites already known, but the method has not been used for discovering new sites, except at Charsada !n Pakistan. But the classic example of the usefulness of this device is the discovery of hundreds of Etruscan tombs in Italy. By studying shadings of the soil, relative growth, vegetation, shadows and markings revealed in the oblique light of dawn or sunset, and with the help of new films and filters and three dimensional viewers aerial pictures can almost be said to "talk". And Banditaccia (north of Rome); a city of tombs with its outlines of vanished roads, or buried ruins invisible from the ground showed as on an X-ray.

Electrical Resisting Surveying

Even when aerial photographs have indicated the existence of ancient sites, "the markings they show must be found on the ground". This is often difficult. and at times impossible, because "they may have been blotted out entirely by farmer's plough". However, with this method, it is possible to detect irregularities or buried features, to "see" into the ground. Hidden rocks, walls, terraces, roads or .tombs may be found and pin-pointed. This is done by sending an electric current along a predetermined path and by measuring differences in electrical potential at given points.

Magnetic prospecting or Surveying

To this has now been added magnetic prospecting[11] or surveying. It is "complementary to aerial photographing in that it gives exact location on the ground and that it responds well to isolated features such as pits and kilns. Though it is not sensitive to stone walls and foundations, it is particularly sensitive where fire or food is concerned." In England, recently, "using two proton magnetometers, each with a team of three operators, a basic survey of the whole of four areas was completed in eight hours." Where the occupation debris are not thick, but comparatively thin, say about 24 inches—which is very rare in India—this method will prove extremely expeditious in detecting ancient finds.

Photographing the Interior of a Cave without excavation

The most wonderful thing is that the Etruscan tombs, ranging in date between the 8th and the 2nd century B.C., but a great number of about the 6th century B.C., are now

11 *Antiquity*, Vol. XXXIII, 1959, pp. 205-07.

being photographed from inside without excavation with the help of a periscope camera. It includes a photographic drill consisting of a three inch tube which is fitted with a tiny Minox camera. This takes a film only slightly larger than that of a 8 mm. home movie. A high intensity photoflash unit behind another window in the tube provides light. The tube is lowered through soil, rock and the roof of the tomb itself, in a hole previously bored by an electric earth drill. Remote control then triggers the light and camera, advancing the film after each exposure. In 12 shots, turning the tube 30 degrees after each one, the entire interior of the tomb is thus photographed.

With this "Eye of Minos" as the contraption is dubbed, it is possible not only to tell if a tomb is empty or hopelessly disintegrated, forestalling useless excavation, but also to make an exact photographic record of the contents of a sealed chamber before it is opened to the light of modern day.[12]

We have thus travelled a long way in the last 100 years. No longer is the aim of archaeology "to have an accurate description—illustrated by plans, measurements, drawing, or photographs and by copies of inscriptions—of such remains as deserve notice" or "a complete search over the whole country and a systematic record and description of all architectural and other remains that are remarkable for their antiquity or their beauty or their historical interest", as was defined by Cunningham in 1870 according to the needs of the times; or a history of art as envisaged by Burgess in 1886; or, as Lord Curzon so nobly put it in 1902, "it is our duty to dig and discover, to classify, reproduce and describe, to copy and decipher and to cherish and conserve".

Nor is it sufficient to have a knowledge of mere "chronological sequence", as Sir Leonard Woolley recommended, or a timetable of sequence of cultures, as Dr. (now Sir) Mortimer Wheeler, so tellingly expressed in listing the needs of Indian Archaeology in 1944. Each of these aimes or objectives might have been justified by the circumstances prevailing at each period when these aims were laid down, (And I for one would not criticize our predecessors, for we are all creatures of time and circumstances, and become wiser after the event.)

Knowledge of the "Whole Man"

The aim now is—whether it be in India, England or America—to know the whole man : the objects, artistic or otherwise, made by him and the environment in which he lived, *viz.*, the climate, the flora and fauna and man's social, religious and economic status, including even the probable guess as to the density of population, and finally the stage or stages by which he reached the particular stage under study.

Excavation and Crime Detection

Consequently the excavation, and the preceding and consequent exploration, has become something like the work of Sherlock Holmes, where nothing is neglected, much less discarded. Most minute changes in the colour of the soil or earth excavated are

12 Adapted with slight omissions from an article by Carlo M. Lerici, "Periscope on the Etruscan Past", *National Geographic Magazine*, Vol. CXVI, No. 3, September 1959, pp. 336-50.

recorded, collected and scientifically examined, and the same care is bestowed on the ash or charcoal as on a precious object of art. If it is an architectural monument, not only is it carefully drawn and photographed, but all possible means are employed to learn about it significance—about the nature of the stone used and its source, about the technique of manufacture—so that we may learn not about its architectural style, but also about the social, economic, industrial and religious *milieu* which were responsible for its creation.

Nor is all this attention to be devoted only to one particular period of history or prehistory of this country or that. The same care, the same attention, is to be shown to everything, everywhere. For archaeology has become universal in its appeal.[13]

The aim of archaeology being so all-embracing—touching every aspect of human life and its relation to animal, vegetation and physical world around man—the methods of achieving these aims are being constantly refined. Thus by broadening our aims and our perspectives and by perfecting or modifying our methods[14] the entire humanity's past will be recreated.[15]

13 In corroboration of this may be cited the recent symposium on "From 15,000 B.C. to the Thresholds of Urban Civilization—A World-wide Consideration of the Cultural Alternative," held by the Wenner-Gren Foundation for Anthropological Research at Burg Wartenstein near Vienna.

14 According to a new method called "Pottasium Argon" which was tried on the skull and jaw found at Olduvai, Tanganyika, East Africa, man and the associated tools are 1,750,000 years old.

15 After writing this I came across Professor Grahame Clark's Presidential Address, "Perspectives in Prehistory" to the Prehistoric Society, London, in 1959 (*Proceedings of the Prehistoric Society for* 1959, New Series, Vol. XXV, pp. 12-14), wherein he says :

> Whatever our interests, whatever special area or period we may prefer to study in detail, our work is likely to be better as well as more worthwhile if we view our immediate task in the broadest perspective, as part of an effort to understand the common past of humanity. I have just said that from some points of view their histories are among the most important products of the great literary traditions of humanity. I believe that a comprehension of prehistory will prove to have been one of the most significant achievements, and requisites. of the world-wide society which is even now struggling for the first time into existence. By and large the history of history is the history of expanding conceptions of what constitutes history. The scope of history has grown with the scope of social awareness, from the history of the hunting band to that of the village, from the history of oral traditions to that of the written record, from the history of nation or civilization to the history of mankind. To-day we are being knit together, not merely by improving means of communication and by the material nexus of industrial civilization, but increasingly by an awareness of our common heritage as men : it is by enhancing and deepening this awareness that societies like our own have most to contribute, and the quality of their contributions will depend more than anything else on the perspective from which they view history.

2

Indian Archaeology and its Contribution to Prehistory and Protohistory

In the first lecture I have described to you how the aims and perspectives of archaeology were being widened not only in India, but all over the world, and how and what new methods were being employed in attaining these aims. And it may well be asked "how have these changing aims and methods contributed to our knowledge of the various periods in which man's history is conventionally divided into prehistory, protohistory and ancient history?" Our attention will be primarily focussed on India, though important discoveries made elsewhere will be referred to if and when necessary.

Before entering into details, let us understand what is meant by 'prehistory' and 'protohistory': how are these distinguished or differentiated from each other on the one hand and from history on the other.

The definition of 'history' is too well known. Briefly it is a written account of an incident, place or country, a person or a nation. If written by an eye-witness or immediately after the happening of the eveat, it is called 'contemporary history'; but, whenever recorded, the essential feature is that it is recorded in writing.

Prehistory

Now it is this feature which distinguishes history from prehistory; the latter, prehistory, deals with a period when writing was unknown in or to the particular country or amongst the people whom we are studying, and so no history is possible. This, in other words, means that the people were illiterate. They did not know how to write and consequently how to read. Possession of this kind of faculties is now-a-days regarded (by anthropologists and archaeologists) as a sign of civilized life or civilization

(though it may be disputed by many in India). It is, therefore, also usual to define prehistory as an account or study of the people who were illiterate (and of their activties) or of a pre-literate society.

History of a country, therefore, commences from the time its written records are available, and the period which precedes this is called "prehistory".

If we strictly apply this definition to India, we find ourselves in a rather uncomfortable position.

The earliest written records that we have today (and which have been deciphered) are the rock and pillar edicts of Asoka, about 260 B.C. It is, therefore, customary .o say that in India the historical period begins, *very strictly*, in the 3rd century, but *loosely* about the 6th century B.C., allowing three centuries for the origin and devolopment of writing. The sixth century again is the time of the period of the Buddha and Mahavira and of several large states in Northern India, implying thereby a civilized life, and certainly writing.

Most Western authors—historians, archaeologists and anthorpologists—would, therefore, regard or call all this long period ending with 6th century B.C. and going back to the dim past, to the beginning of man, as prehistory, when man was illiterate, savage and barbarian (anthropologically but not necessarily spiritually or morally).

Protohistory

This definition of Indian prehistory is difficult for all Indians to accept. For it leaves out our entire Vedic literature—from the *Rigveda* right upto *Yāska* and even the *Sutras* of Gotama, Apastamba—as works of a people who were illiterate, and the state of life depicted in it as semi-barbarous, if not that of a savage. This is, however, an anthropological definition, which emphasizes only the *material* aspects of life—such as writing, agriculture and then city (or urban) life—as marks of civilization.[1] It does not take into account the *spiritual* heights which these socalled "illiterate" people might have attained. We in India have been traditionally valuing highly these "outbursts" either in the *Rigveda* or in the *Samaveda* or the speculations of the *Upanishads* and the foundations of etymology which Yaska had laid down and the systematization of the four-fold life—the *Ashramas* in the *Sutras*. Whether writing was known at this period or not is immaterial; much of our present way of life—social and religious and, until the last century, economic—has its root, its inspiration, in this Vedic and post-

1 No succinct definition is yet available of the term "civilization". So Robert J. Braidwood attempted one in his *The Near East and the Foundations for Civilization*, Oregon, U.S.A., 1952, p. 2. He gives the eight elements :

(*i*) Fully efficient production, (*ii*) cities, urbanization, (*iii*) formal political state, (*iv*) formal laws, (*v*) formal projects and works, (*vi*) classes and hierarchies (*vii*) writing and lastly (*viii*) monumentality in art.

But when a stone wall was found in a pre-pottery level at Jericho in Palestine, dated about 7000 B.C., an interesting discussion followed in *Antiquity*, Nos. 119, 12 , Vol. XXX, 1956; No. 122 Vol. XXXI, 1957), between Wheeler, Braidwood, Woolley and Miss Kenyon as to what this phase of Jericho should be called; for "a wall", implying an organized effort on the part of a society, but without agriculture, was outside the archaeologists' definition of a "city" or "civilization". So present-day definitions of civilization are relative.

Vedic literature. I have, therefore, called this period (covered by the *Vedas*, *Upanishads* and early *Sutra* literature) "protohistoric". For it is the source of our ancient history and culture. Its actual age will vary and change, according to the dates we are inclined to give to it.

Protohistory will also include, as the late Rev. Father Heras, was, I think, the first to point out, the Indus or the Harappan Civilization. In the first place its authors knew writing; it is not their fault if we are not able to decipher it to our satisfaction. As soon as this writing is read, the Indus Civilization will no longer remain protohistoric, but along with the Egyptain and Sumerian (and now Myceanean) will enter the arena of history. Secondly, if this people lived in towns and cities, having a much better sanitation than is found in many parts of India and the world today, produced their own food and even indulged in foreign trade and commerce, what right have we to call them "uncivilized"? Thus, the Indus people were not uncivilized. Rightly, therefore, Sir John Marshall and, following him, Sir Mortimer Wheeler have called their books on this subject *Indus Civilization*.

This civilization is again protohistoric for me, because as Father Heras and several other scholars have pointed out, certain (many) of our ways of life and rituals can be traced back to it. Thus protohistory in India includes three things or periods at present:

(*i*) The Vedic and post-Vedic period, ending about the 6th century B.C. (so far as the literature is concerned).

(*ii*) The Indus or Harappan Civilization.

(*iii*) The various Early Chalcolithic or Late Neolithic Cultures. These, I *believe*, in many of the regions above mentioned, were contemporary with and, perhaps, related to our protohistoric literature.

Prehistory will then comprise the various Stone Ages when man was a nomadic hunter, a 'savage', as he is called. However, it must be clearly pointed out here that this does not imply a uniform cultural development, all over India, and at the same time. What is true of the world, is also true of India on a small scale.

Thus, for instance, Australia and several parts of Africa were in the Stone Age until the 18th-19th century A.D. Man there did not know the use of metals, writing, agriculture, etc. Prehistoric conditions prevailed. Thus while the major parts of these continents were in the Stone Age, India, Europe and America had achieved modicum of civilization. During these few centuries, the Western countires have forged ahead, leaving India still in a "cow-dung, wood, and iron age", with over 60 per cent of its population illiterate and therefore "anthropologically" uncivilized. To take another instance from the political field, while British India began to enjoy a sort of democratic rule since 1919, several other parts of India had a feudal state of government. Thus in a large country like India, unequal cultural development is to be expected, particularly in the very early stages of man's development. This is due mainly to geographical reasons, as Dr. Subbarao has so convincingly shown.[2]

2 Subbarao, B., *The Personality of India*, Baroda, 1958.

Geographical and Chronological Limits of Prehistory and Protohistory

Going back to the consideration of prehistory and protohistory, it may be said that:

(*i*) The ancient historical period begins, on the present evidence, in about the 6th century B.C. [say for most of Northern India, including Sind, the Punjab, U.P., Bihar, Central India, parts of C.P. (M.P.), Rajputana, Gujarat and Saurashtra and Maharashtra (only Vidarbha), *but excluding, perhaps, Assam, Orissa, Andhra, Madras, My:ore and Kerala*].

(*ii*) All the above mentioned States (or regions) and in addition Northern Mysore and Western Andhra were emerging from the last stages of the Stone Age on to the stage of protohistory, though there were large areas—larger than in the succeeding period of ancient history—such as Northern Gujarat, Western Rajputana, which were still in the final stage of the Stone Age.[3]

(*iii*) On the available data this protohistoric stage seems to have lasted from about 5000 B.C. to 2500 B.C.

(*iv*) An exception has to be made in the case of Sind, the Punjab and Western U.P. (as far as Delhi), Saurashtra and the Western Coast of Gujarat (upto Surat) in the list of regions mentioned above, and we must say that these had attained a higher—urban stage of civilization—in the earlier phase of the protohistoric period, *but later lost it*.

(*v*) That the prehistoric period—which includes all the phases of the Stone Age—covered a period approximately from 150000 to 5000 B.C.[3a]

It is, therefore, most probable that when the origins of the Indus Civilization are known, this lower limit, viz., 2500 B.C. will be pushed back by at least 500 years, if not more.

With these broad definitions of Indian prehistory and protohistory, I will first take up prehistory and indicate briefly what contributions have been made in this field in the last 20 years.

Compared to what we knew of this subject before 1939, the progress is indeed remarkable. For after the early geologists like Robert Bruce Foote, had made the first discoveries in the eighties of the last century, first in Madras and then in Northern Gujarat, clues of the Palaeolithic or Old Stone Age had been obtained from several other parts of India. But except in two or three cases, these clues or evidences were from the surface. And for several decades, nearly 50 years, no attempt was made to put this knowledge on a secure foundation. This lull in purely prehistoric investigation was broken by the Yale-Cambridge Expedition which worked in the Kashmir Valley and in the foothills of the South-Western Himalayas, around Rawalpindi. The

3 This remark applies to all the phases, for even when a region had attained a certain status, it does not mean that it has reached this state in every nook and corner of that region. Even now, as soon as we step out of the limits of Greater Bombay, we shall find differences in cultural and economic status.

3a The upper limit may go up as mentioned on p. 24 fn. 14a.

results of this investigation have been rather summarily published *as far as the purely archaeological material is concerned*, though the geological and climatic aspects have received full attention in the report.[4] Short summaries of this work have appeared since then several times.[5] I shall, therefore, confine myself to the most important aspects of the work.

Previous to the planned and systematic discoveries of De Terra and Paterson, Dr. Wadia, and Dr. Terra himself, besides Lieutenant Todd, had found specimens, and earlier still, in 1880, a few stone tools had been found in the Soan Valley. But these were mostly from the surface. So neither their age nor cultural significance could be understood. And therefore the first important aspect of De Terra's work was to determine geologically the ages or periods of the various deposits in the Kashmir Valley and to ascertain their relationship with the tool-bearing deposits in the Punjab. Their investigations, modifying to some extent the views of the previous workers, confirmed the existence of four Ice Ages and three Interglacial periods in the Kashmir Valley and the south-western slopes of the Himalayas during the Pleistocene period. This is the period which preceded the present (Holocene) some 10,000 years ago and extended back in time to five to ten lac (1,000,000) years or so. During this period, Europe and North America had also witnessed four Ice Ages and, besides, periods when the climate was not so cold (the ice having retreated to much higher altitudes). The latter are, therefore, called "Interglacial" periods.

The rest of India and Africa suffered from alternate "Wet" and "Dry" periods; the former are also sometimes called "Pluvials." However, it is not yet established whether the Ice Ages and the three interglacial periods coincided with the wet and dry phases or not.

The first tools of man were found in the deposits of the 2nd Ice Age on the bank of the Indus, Soan and other rivers in Western Punjab. Tools were then discovered in all the subsequent deposits of the 2nd Interglacial, 3rd glacial, etc., as shown in the diagram (Fig. 4).

These tools show a kind of evolution in the sense that the earliest tools are large and crude, without much work on them, whereas the later ones are smaller, neater and finer. These are, therefore, divided into early Soan and late Soan; the former falling within the Middle Pleistocene and the latter into the Upper Pleistocene. We are, thus, able to discern the development of man's mind—from his craft—over a long period of time through varied climatic conditions.

As far as the tools themselves are concerned, they fall into three main groups:

(*i*) Pre-Soan
(*ii*) Soanian or Chopper and Chopping tools on pebbles and flakes.
(*iii*) Handaxe.

4 De Terra and Paterson, T.T., *Ice Age in Kashmir Valley and the Associated Human Cultures.*

5 Sankalia, H.D., in the *Vedic Age*, Bharatiya Vidya Bhavan, Bombay 1951, pp. 123-40. Krishnaswami V.D., "Stone Age India", in *Ancient India*, No. 3, 1947, p. 14, and twice or thrice by Dr. Movius Hallam Jr. of the Peabody Museum, Harward University, U.S.A.

Not much is known about the pre-Soan, because very few tools were found. The important things is that these are the earliest tools stratigraphically found from a deposit known as "Boulder Conglomerate". (See Fig. 4.)

It is, however, the Soan types of tools which are distinctive. These are in a sense quite different from what is called "handaxe" and is known from all over India, Africa, Europe and parts of Western Asia. The tools are called after the river Soan, Sohan (Sanskrit Shobhanā). It flows past the town of Rawalpindi. The tools, very briefly, are made on broken halves of pebbles and generally chipped from the underside upwards on the broken side of the pebble. These sides then provide the cutting, scrapping or chopping edge, and the unchipped pebble surface on the other side serves as a suitable hand-hold. From the size and nature of the edge, the tools are called Choppers, Chopping tools and Scrapers. (See Fig. 6).

Since such tools were not (then) found in other parts of India, but differ fundamentally from the handaxes, and are confined only to the Punjab, it was assumed that these tools were made by a type of man who might have been different culturally (and even racially) from the maker of the handaxe.

New Work on Old Stone Age

The work of the Yale-Cambridge Expedition gave a fillip to the purely prehistoric researches in India. The almost dying embers were rekindled, albeit slowly in the beginning. Rao Bahadur K. N. Dikshit, the then Director-General of Archaeology of in India, organized an expedition in co-operation with the Deccan College Post-graduate and Research Institute, Poona, and the Gujarat Research Society, Bombay, to work in Gujarat on the clues left by Robert Bruce Foote in the last century. About the same time the Anthropology Department of the Calcutta University started work on the Stone Age in Mayurbhanj. The association of the Deccan College with the work in Gujarat had a far reaching effect, It has been able to continue the line of investigation opened up in 1941, and its students and staff have so far systematically covered parts of Andhra[6], Karnatak[7], Maharashtra[8], Gujarat[9], Malwa[10], Central India[11], Southern Rajputana[12] and Orissa[13]. Of late, officers of the Department of Archaeology have also been reporting discoveries in some of the areas, besides those

6 Issac N., *Stone Age Cultures of Kurnool*, Ph.D. Thesis, 1960, Deccan College and Poona University Libraries.

7 Joshi, R.V., *Pleistocene Studies in the Malaprabha Basin*, Poona, 1955.

8 Sankalia, H.D., *The Godavari Palaeolithic Industry*, Poona, 1952, and Sankalia, H.D., "Animal Fossils and Palaeolithic Industries from the Pravara Basin, District Ahmadnagar", *Ancient India, (A.I.)* No. 12, 1936, pp. 35-52; and Banerjee, A.D. *Middle Palaeolithic Industries of the Deccan*, Ph.D. thesis, 1957, Deccan College and Poona University Libraries.

9 Sankalia, H.D., *Investigations into Prehistoric Archaeology of Gujarat*.

10 Khatri, A.P., *Stone Age Cultures of Malwa*, Ph.D. thesis, 1958, Deccan College and Poona University Libraries.

11 *Indian Archaeology—A Review (I.A.R.)*, 1959-60, pp. 21-22.

12 *I.A.R.* 1958-59, pp. 42-45; and 1959-60, pp. 21-22.

13 Mohapatra, G.C., *The Stone Age Cultures of Orissa*, Ph.D. thesis, 1960, Deccan College and Poona University Libraries.

in the former Central Provinces[14], West Bengal[15], Uttar Pradesh[16], and Eastern Punjab[17]; the Anthropology Department of the Calcutta University has continued its work in Mayurbhanj[18] and recently extended it to Southern Bihar[19] and Eastern Punjab[20].. Among the new Universities, that of Baroda has taken up investigation in Central Gujarat[21] as well as the Bombay region.[22]

Results

The result of these investigations is that the palaeolithic map of India is being rapidly filled up. One may say, without being contradicted, that the Early Stone Age man roamed at will along the small and large river valleys almost everywhere in India, except in Assam, Kerala, Sind, Western Rajasthan and probably the Central Gangetic Valley. Initially it appeared that the man in the Punjab was different from that of the rest of Indiā, as his tools were fundamentally different from his contemporaries in the latter region. However, in the Punjab itself, De Terra has noted the co-occurrence, *though not in the some place*, of the Soan as well as Handaxe industry in the Second interglacial deposits. Of late, Soan type of tools are found in increasing numbers as far south as Kurnool in Andhra State, and in appreciable numbers in Maharashtra, Northern Gujarat, Southern Rajputana, east Madhya Pradesh, Uttar Pradesh as well as in Orissa. (Fig. 5). It has, therefore, become imperative to re-examine the whole question of the division of the Early Stone Age in India into two clear halves as Soan and Handaxe. The re-appraisal may prove that this division is not justified.

Climatic Conditions and Environment

Whatever it may be, it has been amply demonstrated that the first appearance of Early Man in the rest of India occurred when the climate was more wet than at present. and the rivers as a consequence carried heavier load in the form of pebbles and boulders, which they laid down when the climate become drier. This explains the deposition of a pebbly gravel bed in almost all the rivers that have been examined till to date. This was followed by a still drier and quieter phase when the rivers deposited fine silt over the earlier pebbly gravel. Man seems to be absent during the later phase of this cycle

14 *I.A.R.*, 1959-60, pp. 31-33.
15 *Ibid.*, pp. 48-50.
16 Krishnaswami, V.P., "The Lithic Tool Industries of the Singrauli Basin", *A.I.*, No. 7, 1951, pp. 40-65.
17 Lal, B.B., "Palaeoliths from Beas and Banganga Valleys", *A.I.*, No. 12, 1956, pp. 59-92.
18 Bose, N.K. Sen, Dharani, and Ray, Gautam Shankar, "Geological and Cultural Evidences of the Stone Age in Mayurbhanj", *Man in India*, Vol. 38, No. 1, 1958, pp. 49-55.
19 Sen, Dharani and Ghosh, Ashok Kumar, "On the Occurrence of Palaeoliths in Singhbhum", *Man in India*, Vol. 40, No. 3, 1960, pp. 178-91.
20 Sen, Dharani, "Nalagarh Palaeolithic Culture". *Man in India*, Vol. 35, 1955, pp. 176-84.
21 Subbarao, B., "Archaeological Explorations in the Mahi Valley", *Journal of the Maharaja Sayajirao University of Baroda*, Vol. 1, 1952, pp. 33-69.
22 Malik, S.C., *Stone Age Industries of the Bombay and Satara Districts*, M.S. University Archaeological Series No. 4, Baroda, 1959.

of wet and dry period. During this period Man must have lived along river banks, in a country which was fairly but not heavily wooded.

Tool Types

Almost everywhere the tools comprise of various types of handaxes and cleavers, chopping tools and cores. (Fig. 7). So far no clear-cut division between the earlier Abbevillian type of handaxes and later Acheulian handaxes can be stratigraphically demonstrated. So it has got to be inferred that Man existed in or entered India with an advanced knowledge of flaking tools. If he came from outside, then Africa is the likely country of his origin. From here India might have got the handaxe industry including the so-called "S twist" ovate, which according to Leakey[23], migrated from Europe to Africa. This industry also included the Levallois flake element, as in Africa and in Western Europe, as recently demonstrated by Bordes.[24]

Discovery of another Stone Age

Side by side with the Early Palaeolithic or Old Stone Age, evidence for another Stone Age culture has come forward in the last few years. Its first traces were found as far back as 1943[25] at Nandur-Madhmeshwar on the Godavari. But it is only since 1954-55 that its character is becoming clear. Essentially the tools consist of different types of scrapers and points[26] and tools known as borers or awls[27] and borer-scrapers and a few blade-like flakes (but not blades, for these do not show the characteristic flake technique). (Fig. 8-9). This tool complex is quite different from the Handaxe-Cleaver as well as the Early Soan, though some of the tool types might be compared with those of the Late Soan. Not only are the tool types markedly different from those of the Old Stone Age, but generally the raw material of which they are made is also different. Fine-grained material like chert, jasper, chalcedony, agate was preferred to trap (basalt), quartz and quartzite. Tools like these were hitherto known from the surface and were therefore regarded as late, and since they were (comparatively) small, were thought of as a part of the microlithic (or Mesolithic) culture. However, stratified deposits have been recorded since 1954 (or 1943) from gravels which seem to overlie the older eroded gravel against the high cliff-like silty banks, or over the gravel and silt cycle of the earlier period in Maharashtra,[28] Andhra[29] (Kurnool), Karnatak[30]

23 Leakey, *Adam's Ancestors*, 4th edition, London, 1953, pp.77.

24 Bordes, F., *Proceedings, Prehistoric Society for* 1956, New Series, Vol. XXII, p.5.

25 Sankalia, H-D., "Studies in Prehistory of the Deccan etc." in *Bulletin, Deccan College Research Institute*, Vol. IV, 1943, pp. 186-203. In fact, in the light of our present knowledge the agate flake found by Wyne at Mungi near Paithan in 1863 would be the first tool of this Stone Age Culture.

26 Allchin, Bridget (see below for full reference) notes only a few points and comments on their absence or rarity, (pp. 10 and 29). But this seems to be due to the limited nature of her collections.

27 Allchin also use the term "beak" for the awl-point.

28 Sankalia, H.D,, Deo, S.B., and Ansari Z.D., and S. Ehrahardt *From History to Prehistory at Nevasa*, 1960, Poona. p. 105.

29 Isaac, N., *Stone Age Culture of Kurnool*, Ph. D. thesis in Archaeology, Poona University and Deccan College Libraries, 1961; and also Bridget Allchin (See footnote 32).

30 Banerjee, K.D., *op. cit.*

Malwa,[31] Central India and Southern U.P.[32], Orissa,[33] whereas in Southern Rajputana[34] they appear in the earliest culture in the Luni Valley. Further discoveries are reported from other areas.[35]

Geographic Extent

Thus there is no doubt the wide extent of this Stone Age culture. It was almost co-extensive with the earlier one, and seems to have flourished when another wet and dry climate had followed the first one. This was of a comparatively milder nature, for the river gravel is much smaller in nature and the silt deposit not so thick as the first one. Hence this deposit appears to rest against the older formation.

Stone Age Man : his Environment

Though some of the earlier animals like the wild ox (*Ox nomadicus* Falconer) seemed to have survived, the man of this period was probably quite different, though as yet no traces of this or the earlier man are found. Any way his tools undoubtedly indicate that his way of life was different; for though both were hunters and collectors of food, this man probably hunted with a spear or javelin and even a bow, as the points, some of which are tanged, show. The hollow scraper would have been used as spoke-shaves, as smoothers of shafts of these weapons, and the borers or awls for piercing the skins of animals, etc. and the scrapers for dressing them. Man's habitation was once again on open river banks and near rocks where the raw material was easily available. The country must have been wooded, but, perhaps, less thickly than during the previous Stone Age.

Name : Nevasian

Since the tools occur in a gravel, overlying the earlier deposit and underlie later deposits containing microlithic industries, it was thought advisable to designate the culture as "Middle Palaeolithic"[36]. However, this term presupposes the existence of an Upper Palaeolithic culture which is not yet well attested from many regions. It was therefore suggested that a term of much wider connotation, like the "Middle Stone Age"[37] be applied to it. This is also found to be unsatisfactory. Hence, as is the

31 Khatri, A.D., *op. cit.*
32 Allchin, Bridget, "The Indian Middle Stone Age etc.," in the University of London Institute of Archaeology *Bulletin*, Number 11, 1959, pp. 1-36.
33 Mohapatra, G.C., *op. cit.*
34 *I.A.R.*, 1959-60. pp. 39-40; and Misra, V.N. *Stone Age Cultures of Rajputana*, Ph.D. thesis in Archaeology, Poona University and Deccan College Libraries, 1961.
35 *Ibid.*, 1955-60.
36 Sankalia, and others, 1960, *op. cit.*
37 Subbarao, *The Personality of India*, 1958, pp. 37-41. And after him Bridget Allchin, *op. cit.*

common practice with archaeologists and anthropologists, it is proposed to call the culture by the type site—Nevasa—"Nevasian".[38] This name prefixed with the regional name as "Karnatak or Orissa Nevasian" will gave a correct idea about the nature of the culture, without involving questions of its place in time or any relation to the Middle Palaeolithic Industry of Western Europe[39] or Northern Africa.

Upper Palaeolithic Culture

The Upper Palaeolithic in Western Europe has such well-marked and unusual features that it is well-nigh impossible to expect a repetition of the same elsewhere, for these were a product of peculiar climatic and corresponding floral and faunal surroundings. We should, therefore, be satisfied if we find even a part of the Upper Palaeolithic tool assemblage with several kinds of blades (fine, thin or thick, narrow as opposed to broad flakes removed from cores which look fluted as the blades are struck off by pressure flaking or with the help of a punch). Associated with these in Europe are several kinds of burins or tools with a chisel-like edge made by a vertical blow for engraving in bone or stone and on cave walls.

Two regions in India—one Kurnool[40] in Andhra and the other Bombay[41] in Maharashtra—had yielded a succession of industries, though now it appears[42] that in the latter the tools probably belong to one or at the most two culture groups only. Thus the existence of an Upper Palaeolithic culture is not yet well established in India. More systematic search is necessary in the limestone and sandstone cave regions of India, like Bhopal, Sagar, Jabalpur in Madhya Pradesh, Mirzapur in Uttar Pradesh and Kurnool in Andhra.

Mesolithic or Transitional Cultures

Tiny implements called "microliths" had been reported from a number of sites even in the last century. The list of these has been considerably augmented by the subsequent research during the last 20 years. Robert Bruce Foote had placed them in the Neolithic period since in some regions they occured with potsherds which herald definitely a higher state of life. Other scholars, particularly Indian, regarded them as of higher antiquity and belonging to a Mesolithic Stage of culture, between the Palaeolithic and the Neolithic, whereas others regarded them as almost recent.

Though no definite light has been thrown on this problem within the last 20 years,

38 Banerjee, K.D., *op. cit.* p. 143.

39 Even here the term is being used less and less, for the Levallois which was regarded as the "hall-mark" of this period is now found associated with the earlier handaxe culture.

40 Cammiade, L.A. and Burkitt, M.C., "Fresh Light on the Stone Ages in South-East India", *Antiquity*, Vol. IV. 1930, pp. 327-39.

41 Todd, K.R.U., "Palaeolithic Industries of Bombay", *Journal of the Royal Anthropological Institute of Great Britain and Ireland*, Vol. LXIX, 1939, pp. 257-272.

42 When these lectures were being delivered, Kandivli and Borivli were carefully surveyed by the writer with the help of his two pupils—Dr. G.C. Mohapatra and Shri V.N. Misra. The new sections and tools were also seen by Professor F.E. Zeuner.

systematic work in Northern Gujarat[43], careful observation of their occurrence in Tinnevelly[44], small excavations in West Bengal[45] and detailed study in Mysore[46] have now shown that in all these areas microliths are considerably old—probably Mesolithic. And though it is difficult to generalize, their occurrence coincides with a drier climatic phase and scrub forests. In Gujarat alone, an idea of the life of the people who manufactured these microliths and their times can also be had. Very briefly, these people lived in Northern and Central Gujarat when the climate was slightly more wet than at present. They had occupied, perhaps temporarily, elevated areas—sand dunes—formed during the previous dry period and which enclosed on three sides small inundation lakes. They eked out their living by hunting and fishing. It appears from the large quantities of cut animal bones found in their habitation that these animals—cattle (cow ox), *nilgai*, deer, rhinoceros, mongoose and pig, small burrowing ones like squirrel, ratsimice and tortoise and fish—were brought and cut up in their camps. All these activities were no doubt carried out with tiny tools, points (arrow-heads), awls, scrapers of various types, blades and gravers or burins. No traces of fire have been so far seen, but extremely minute quantities of potsherds do suggest acquaintance with pottery. Quern fragments are so small that these could hardly have been used for grinding grain, even if collected wild. The hunter-fishers' love for the chase is also attested to by their long, slender body, particularly long thin legs. Among the few ornaments are round flat beads and beads of dentalium shell, the latter showing contact direct or otherwise with the sea-coast. Whatever the economic and cultural stage, they had some idea of life after death; for the dead were buried in a highly flexed posture usually in north-south direction. Physically or racially they were fairly tall with long head slightly protruding lower lip and recall the Hamitic people of Egypt.[47]

The microliths from Birbhanpur[48] in West Bengal and the Teris[49] of South India might belong to a still earlier period within the Mesolithic, as indicated by the geological deposit in which they lie and the tool types. Among the latter there are undoubted burins, whereas the small bifacial points from the Teris so far remain unparalleled in India, though slightly bigger ones have been noted by Misra from the Luni Valley in Western Rajputana.

Neolithic or New Stone Age

While the earlier Stone Age cultures belonged to the Pleistocene period (sub-recent), and the three or four microlithic cultures to a border line between the sub-recent

43 Sankalia H.D. "Microlithic Industry of Langhnaj" in *Journal, Gujarat Research Society*, Vol. XVII, 1956, pp. 275-84, and earlier references cited therein.
44 Zeunar, F. E. and Allchin, Bridget "Microlithic sites of Tinnevelly", in *A.I.*, No. 12, 1956, pp. 4-20.
45 Lal, B.B., "Birbhanpur etc." in *A.I.*, No. 14, 1958, pp. 4-48.
46 Seshadri, M., *The Stone-using Cultures of Prehistoric and Proto-historic Mysore, London*, 1956.
47 Sankalia, and Karve, I., in *American Anthropologist*, Vol. LI, 1949, p. 34.
48 Lal, B.B., *op. cit.*
49 Zeuner, F.E. and Allchin, *op. cit*.

and recent, the Neolithic or the New Stone Age cultures definitely fall within the recent. Unfortunately, save for surface collections in this century and the last, so little systematic work has been done in this field that no clear positive picture of the life of the Neolithic people can be had. That these people were pastrol-cum-agricultural employing polished stone tools for cutting as well as dressing the wood (carpentry), can certainly be inferred from their tools. But nothing more; except that three or four Neolithic zones have now been recognized from the study of the tool types and their affinities. Thus we have first the pure south-eastern group covering Andhra-Karnatak, then the eastern further divisible into (*a*) Assam, (*b*) Bihar and Orissa. (Fig. 10).

The third has just come to light from a site—Burzahom—near Srinagar in Kashmir. Small excavations at three or four sites in Andhra-Karnatak—Sangankallu[50], Nagarjunakonda[51], Maski[52], Piklihal[53]. Utnoor[54] and T. Narsipur[55], besides Brahmagiri[56]—show that the people used, besides a variety of partly or fully ground stone implements, a blackish pottery, some of that spouted; domesticated humped cattle, and burnt cattle dung as fuel and perhaps lived in shallow pits which were covered by reeds, etc. resting on undressed wooden posts.[57] Carbon-14 date from Utnoor would place the culture there arounds 2000 B.C.

The Eastern Neolithic Culture, shown by the recent appraisal by Dani[58], was partly received from the Far East. But its nature can only be known when some sites, which abound in Assam and Bihar, particularly Chota Nagpur, are excavated. It is an unanswered but interesting question whether any of the primitive, aboriginal tribes in these regions were the authors of these Neolithic cultures, and further whether these and/or the cultures have in fact arrived from the south-east Asia or even from the West, as Hutton and Sarat Chandra Roy once thought.

The Southern Neolithic met the south-spreading Copper Age Culture in Karnatak and Maharashtra and gave birth to a culture with mixed traits—polished stone axes, blade tools of chalcedony, painted pottery of limited range but highly sophisticated and well fired, and burials in earthern pots, sometimes of macerated bones only, (that is bones collected from bodies exposed after death), and fully extended burials right on the earth. This had a fairly large geographical extent embracing Karnatak, Andhra

50 Subbarao, B., *Stone Age Cultures of Bellary*, Deccan College Dissertation Series 7, Poona, 1948.

51 *I.A.R.* 1959-60, pp. 5-10.

52 Thapar, B.K., "Maski 1954: A Chalcolithic Site of the Southern Deccan", *A.I.*, No. 13, 1957, pp. 4-142.

53 Allchin, F.R., "Poor Men's Thalis: A Deccan Potter's Technique" *Bulletin of the School of Oriental and African Studies*, University of London, Vol. XXII, 1957, pp. 250-57.

54 *I.A.R.*, 1958-59, p. 11.

55 *Ibid.*, 1958-59, p. 33.

56 Wheeler, R.E.M., "Brahmagiri and Chandravalli 1947: Megalithic and other Cultures in Mysore State", *A.I.*, No. 4. 1947, pp. 180-310.

57 Such evidence was first had at Nevasa in 1954-55. This season's as well as last season's work have yielded similar evidence. Further corroboration comes from Nagarjunakonda in Andhra, *I.A.R.*, 1959-60, p. 6.

58 Dani, Ahmad Hassan, *Prehistory and Protohistory of Eastern India*, Calcutta, 1960.

(Western) and whole of Maharashtra. With it we enter, as explained above, the sphere of protohistory and hence further details about it will be given later.

The Indus or Harappa Civilization

During the last ten years extensions of the Harappa or Indus Civilization have been located in East Punjab and Uttar Pradesh, almost near Delhi; in North Rajputana in the former State of Bikaner; in Kutch and almost all over Saurashtra and Central and Southern Gujarat as far as Surat. (Fig. 1). Equally significant are some of the new features, unknown before.

Extent

The frontiers of this civilization which were already very extensive, some 1000 miles by 500 miles,[59] have been further extended by some hundred miles both in the east and in the south. Thus *roughtly* the civilization covers an area of 1200 × 700 miles= 840,000 square miles in arca. Not only is its vast expanse remarkable and unique for a prehistoric culture, among the then contemporary or immediately earlier or later cultures, but it is also noteworthy for the almost unfailing uniformity of the various aspects of the civilization such as town planning (including mudbrick ramparts), well--ligned brick houses, sanitation, pottery, seals, ornaments, weights and measures, and method of disposal of the dead. No doubt a few variations have been observed in pottery fabrics, forms and designs, but these cannot be discussed here in detail unless and until full reports of three or four important excavations are published. Neverthe-less, some great unifying factors seem to be actively workirg behind this feature. What it is, we do not exactly know—a great governmental organization, or the innate sense of its citizens trying intentionally or unintentionally to repeat the same features of their city life wherever they went, or their basic needs for such means. Whatever be the facts, with these also went the various technological skills of the city-planner, architect, engineer, mason, brick-maker, potter, seal-engraver and metallurgist. But the questions still remain how and why did the Harappan culture spread eastwards and southwards (and westwards) ? Was it a peaceful advance, in the natural course of events, towards the fertile plains of the Ganges ? Or did they flee as refugees before some invader ? None of these questions can be answered satisfactorily for want of adequate evidence.

East Punjab and Gangetic Valley

Excavations at Rupar and Bara in the East Punjab, Alamgirpur near Meerut, and several sites in Bikaner suggest that these sites were occupied after some lapse of time by the Painted Grey Ware people after they were abandoned by the Harappans. In Saurashtra the story seems to be different. At Lothal the main Harappan Civili-zation shows a maturity and degeneration, but no replacement by another culture.

59 Wheeler, R.E.M., *The Indus Civilization*, p. 2.

At Somnath a few Harappan features have been noticed in the pottery forms in the lowest deposits, which indicate that the habitation began with a Harappan bias, but this was soon lost when other influences became dominant. This was not the case at Rangpur, where a kind of evolution is witnessed after Period II, suggesting that the Harappan culture was not forcibly replaced or abandoned, but changed imperceptibly into a new one, owing, of course, to contact with newer elements. Thus the story of the Harappan Civilization is different in the Punjab and Saurashtra, two of the most outlaying provinces of its culture-spread.

With this introduction, we shall see in some detail these regional manifestations, though the account cannot be in any sense final, unless definitive reports are published.

The Harappan settlements in East Punjab are found to date on the Sirsa and other smaller tributaries of the Upper Sutlej, now comprised within the districts of Ambala, Jullundur and Bhatinda. Thus besides Rupar, which is the principal site, we have[60] Bikkun or Dher Majra, Bara, Kotli, Talapura, Chamkaur, Hawra (having an extensive mound), Dhang, Merhanwala, Dhogri, Madhopur[61] near Jullandar and Raja Sikak,[62] 2 miles to the south of Faridkot. The sites at Dhang and Merhanwala are situated on the river terraces and flat surfaces on the hills. It is therefore felt that the Harappans proceeded into the hilly terrain along the valleys of smaller rivers. If this can be proved by further work, it may mean a regular colonization. Similar phenomena is witnessed in the Deccan, where sites of the Chalcolithic period of Jorwe-Nevasa type are found in very hilly terrains, which even now are desolate.

So far only Rupar[63] and two sites nearby called Bara and Salaura have been partially excavated. These have yielded very significant evidence regarding the relationship between the Harappan and the later Painted Grey Ware Culture. The Harappan occupation at Rupar took place on the fluviatile sandy deposits; Bara was built with the debris of late Harappan material, Salaura, only 300 yards to the east of Bara, began with the Painted Grey Ware. In addition, at Rupar itself the latter ware was found over the two phases of the Harappan culture. This juxtaposition proves that the Harappan is the earliest culture in the region, and the Painted Grey Ware came much later. The pottery forms at Bara show new forms, not known in the true Harappan, but found in Bikaner. This further seems to suggest that Bara continued to be occupied when Rupar was abandoned by the Harappans. Thus in East Punjab it will be possible to build up a regular sequence of cultures within the Chalcolithic beginning with the Harappan, late Harappan, degenerate Harappan, gap, Painted Grey Ware, and the Northern Black Polished Ware.

The mound at Rupar is nearly 50 ft. high, and occupies a strategic position, viz., at the junction of the plains and the Himalayan foothills. Here the Sutlej enters into the fertile plains of the Punjab. Owing to this fact, it was repeatedly inhabited and

60 *I.A.R.*, 1953-54, p. 38.
61 *Ibid.*, 1956-56, p. 79.
62 *Ibid.*, 1958-59, p. 73.
63 Rupar is about 25 miles from Ch andigarh.

also destroyed, as it lay on the path of the invaders.[64] The several strata show six cultural periods, of which the first two fall within the protohistoric period. Period I constitutes the Harappan and its derivatives, and therefore it is sub-divided into two phases. Its lower deposits exhibit a late phase of the mature Harappan, while the upper deposits introduce new ceramic traditions.

Not much is known about the houses, though four phases of the Harappan buildings were encountered, because the excavations were limited in extent. However, one can definitely say that from the very beginning the first settlers used the local material in the shape of river pebbles, roughly hewn *kankar* stones, besides the traditional material, viz., mud-bricks and baked bricks[65] with which they were familiar. Mud was also used as mortar.

While the ornaments of faience, and various other beads, the steatite seal, terracotta cake, chert blades and bronze celts are but replicas of the now well-known sites of Mohenjodaro and Harappa, and need no comment, the pottery assemblage[66] shows a few variations, which might be explained as a regional phenomenon, or as the excavator thinks, a degeneration or a new feature. The typical Harappan forms include the dish-on-stand, cylindrical beaker, flat platter, shallow basin and perforated brazier. The goblet with pointed bottom is rare, and absent in the upper levels of the Harappan phase. On the contrary, characteristic incised designs on pottery make their appearance now.

Interesting, however, are the burial practices. These confirm once again that among the Harappans, the cemetery was always a litle distance away from the main habitation area. It is now a low mound, about 160 ft. to the west of the inhabited area. This was disturbed by the Painted Grey Ware people. However, some skeletons have remained intact. The grave pits, 8ft. X 3 ft. X 2 ft., were dug into the natural soil. Within this pit, the body was placed in an extended position, with the head usually towards the north-west. In one case, the body lay north-south. Most burials had a group of pots at the head, feet and on the sides of the body. But in one burial, the pots seemed to have been arranged first and then covered with earth. The body was placed last and the pit was finally sealed.[67] The number of pots was not uniform, but varied from 2 to 26. This might be according to the status in life of the individual buried, and so give some idea of the needs, while alive and dead.[68]

The work at the nearby mound of Bara is very briefly noticed. As mentioned earlier it consists principally of the very late Harappan phase. Some pottery forms are new, whereas there is diversity in slips and paintings[69], which is not found in the lower levels at Rupar. There are large water-jars and cooking vessels, and bare horizontal

64 *I.A.R.*, 1953-54, p. 7 and Sharma, Y.D., "Excavations at Rupar", *Lalit Kala*, Nos, 1-2, 19,55-56 pp. 121-29.

65 *A.I.R.*, 1953-54, p. 7.

66 *Ibid.*, pls. IIIA, IV.

67 *I.A.R.*, 1954-55, p. 9.

68 A personal visit to Rupar after these lectures were delivered makes me feel that the site deserves a "total" or horizontal excavation to enable us to know the life of the people in E. Punjab at various periods of its history.

69 *I.A R.*, 1954-55, pls. X, XIA.

or wavy incised lines,[70] a feature which is supposed to be present in the Harappan sites in Bikaner, but unknown at Harappan and Mohenjodaro.

Alamgirpur[71] in Uttar Pradesh continues the story of the Harappan expansion in the Ganga-Yamuna Doab. The site is situated about 2 miles off the left bank of the Hindon, a tributary of the Yamuna. It is 17 miles west of Meerut and 28 miles north-east of Delhi. It is worth watching whether this Indian city also becomes one of the Harappan outposts, and thus the oldest continuously inhabited capital in India. Excavations here revealed four periods of occupation. Periods I and II respectively belong to the Harappan and Painted Grey Ware cultures. Both, however, are separated stratigraphically and culturally. The top surface of Period I was hard and whitish, suggesting a long exposure. It was further found covered with weather-worn potsherds.

No building phases were brought to light in the excavations proper, but kiln-burnt houses have been evidenced by the occurrence of two sizes of bricks : the smaller $11\frac{1}{4}$ to $11\frac{3}{4}$ in x $5\frac{1}{4}$ to $6\frac{1}{4}$ in and $2\frac{1}{2}$in. to $2\frac{3}{4}$in. in width and the larger averaging 14 in. X 8 in X 4 in. Some of the bricks bore three fingermarks.

There is nothing special to note about pottery, ornaments, etc. which are identical in type with those of the true Harappan. Interesting are the platters with a ring-base or three low legs and troughs b:aring incised Harappan symbols. If the low-legged plates were used for making bread, as it is suggested by Dr. Sharma, then the antiquity of the present contrivance is very great. The existence of woven cloth was proved by impressions on a trough. The yarn seems to be fine, though not of uniform thickness. Among the animal figurines, those of a bear (?) and a snake deserve notice.

Saurashtra

As far back as 1934-36, Saurashtra has yielded evidenc of Harappan penetration. Pandit Vats[72] discovered Rangpur and carried out preliminary digging there. Later, it was further excavated by Prof. Ghurye[73] on a very small scale and again by the writer and Dr. Dikshit.[74] The latter scholar thought from his study of pottery that Rangpur had little of Harappan traits. Since then the site has been more fully explored by Shri S.R. Rao[75] who has discovered undoubted evidence of Harappan occupation there. Soon after, Lothal[76] was discovered by the last mentioned scholar. Now every year explorations bring to light more sites of this culture almost all over Saurashtra—eastern, western, northern, southern and even central (which was supposed to be immune from this enveloping movement)—so that the whole of the peninsula seems to have been colonized by the Harappans. If they came from Sind, as it seems most probable, then the coastal route[77] seems to have been preferred, small groups arriving by boats which would keep as near the coast as possible. Whether Kutch was first colonized and Saurashtra later, or the former was treated as a half-way house (the destination being Saurashtra) cannot be definitely known,[78] unless Kutch is fully

70 *Ibid.*, pl. XIB.
71 *I.A.R.*, 1958-59, pp. 50-52, pl. LXII-LXV.
72 *Archaeological Survey of India, Annual Report*, 1934-35, pp. 35-38.
73 Ghurye, G.S. in *Journal, University of Bombay*, Vol. III (N.S.), 1939, pp. 3-11.

explored and one or two sites excavated which would prove the priority of the Kutch Harappan over that of Saurashtra. To date, typically Harappan pottery—perforated jar, handled bowl, dish-on-stand, besides steatite beads, microliths and copper objects —have been reported from the surface at Desalpur,[79] on the left bank of the Morai river, Nakhtrana taluka, and Todia Timbo[80] in Lakhpat taluka.

Why did the Harappans go to Saurashtra? Was it a migration or colonization or an outward march from Sind for "capturing markets"? Unless the causes of the destruction of the Harappan civilization in Sind and the Punjab are well known, the question of this migration or coming as refugees may be ruled out. The last alternative can be considered only if we know of the existence of some earlier inhabitants in Saurashtra who were sufficiently advanced culturally so that trade relations with them would be profitable. Of course, while finally discussing this point, the oft-repeated expressions that the Harappans were traders and chose a site near some river and sea ports have to be taken into account. A suitable port is necessary, if there is a continuous water traffic by sea or river. No conclusive answer can be had at this stage; nevertheless, the question may be discussed a little more fully after we know of the Harappans in Saurashtra in some detail.

First Rangpur, then Lothal, were the only partially excavated sites. However, since 1958 Rojadi, near Rajkot, seems to be another important Harappan settlement, and there might be a few more, if not many. Lothal nevertheless remains the only extensively excavated Harappan habitation in Saurashtra.

Lothal

Set in a dead flat alluvial marshy lowland called *Bhal* in Gujarati, almost at the junction of north-eastern end of Saurashtra peninsula and mainland Gujarat, it may be claimed by both. Today Saragwala, the village which shelters the Lothal mound, (meaning "the mound of the dead")[81] is included in Ahmedabad District being nearly 60 miles due south of that city. Previously, the site might have been on the confluence of the rivers Bhogava and the Sabarmati which is now removed to a distance of nearly two miles to the south-west of Lothal. While this may have been the initial factor in the selection of the site by the first settlers, this very proximity to the rivers nearing the estuary brought repeated and final destruction of the habitation.

In fact, a careful topographical study of the region would show that Lothal once

74 Dikshit, M.G., in *Bulletin, Deccan College Research Institute*, Vol. XI, 1950, pp. 1-55.

75 *I.A.R* , 1953-54, p. 7; 1954-55, p. 59; 1956-57, p. 80. The full report is in press and is expected to be published in 1961.

76 *I.A.R.*, 1955-56, and later.

77 See, however, below p. 57.

78 Rao, S. R. "Excavations at Lothal" in *Lalit Kala*, Nos. 3-4 1956-57, p. 82, seems to think that Desalpur in Kutch and Lothal are the earl est Harappan sites in Kutch and Saurashtra respectively.

79 *I.A.R.*, 1955-56, p. 70. It is regarded as a very promising site.

80 *Ibid.*

81 Rao, S.R., in *Illustrated London News*, February 25, 1961, p. 302.

was on or very near the sea. For, now the region of the Nal lake marshes which joins Saurashtra peninsula with mainland Gujarat was, as was well inferred by the writer in the *Bombay Gazetteer*[82], some 2,000 years ago, or in the time of the Indus Civilization, under the sea which connected itself with the Gulf of Cambay on the south-east and that of Kutch on the north-west. Saurashtra thus must have been an island. Later silting in the above mentioned gulf and the probable decrease in sea-level formed a low, marshy land, which even now gets easily flooded during the monsoon and becomes an inland lake, locally known as *Nal*. Its southern part is called *Bhal*. Here is situated the mound of Lothal.

The area is so flat that no one can imagine that there is a mound which harbours the debris up to a depth of 22 ft. Superficially it looks like a small mole on a large body. Within this debris are enshrined the remains of a town which, according to the latest interpretation of the builiding levels, signs of destruction by flood and other material data, had witnessed two main periods. Period I, having four sub-phases and dated between 2500 B.C.- 1500 B.C. is regarded as the manifestation of mature Harappan Civilization, while decadence characterizes Period II (1500-1000 B.C.).[83] As the mound and the surroundings imperceptibly merge, the exact extent of the town is difficult to calculate, but it is suggested[84] that "the town must have been twice as large as that indicated by the present mound."

Though small, some 2 miles in circumference, it was a well-laid out town, a "miniature Mohenjodaro"[85] with a rampart encircling main habitation, a cemetery without, at a distance of one furlong in the north-west corner, and a unique large brick-built enclosure, which might well be a dockyard, the first of its kind to be unearthed in India or anywhere else. Lothal thus exhibits the characteristic features of the "twin metropolis" and something new in addition.

The "town", it is said,[86] was divided into six blocks, each built on an extensive mud-brick platform of a varying height. So far four streets, two from north to south and two from east to west, with two side lanes, have emerged from the excavations. On one side of a street lies a row of 12 houses. Smaller houses on either side of another street are believed to be shops, each with two or three rooms, with different dimensions, 12 ft. x 9 ft. to 8 ft. x 6 ft. A few larger houses measured 72 ft. x 42 ft. Some had verandahs in front, while others had a central courtyard with rooms around. The houses of artisans like coppersmiths and beadmakers were small and made of mud-bricks.

The town had, as usual, a fine system of sanitation which included a public drain, internal drainage which was joined with the main on the road, bitumen-paved bathrooms and lavatories with a soakpit behind. A very elaborate drainage in a large house in the south block built over a terraced platform coupled with a separate well might

82 *Bombay Gazetteer*, Vol. VIII, Kathiawar, 1884, p. 559.

83 Rao, *I.L.N.*, p. 302.

84 *I.A.R.*, 1958-59, p. 13.

85 This seems to be more appropriate than "miniature Harappa", as suggested by Rao in *Lalit Kala, op. cit.*, p. 84. Shri Rao in his latest "version" of Lothal uses the terms, "acropolis" and "lower town". *I.L.N.*, p. 302.

86 *I.A.R.*, 1959-60, p. 17.

have belonged to an important person, or might be a public house, since it overlooks a large "dockyard."

This huge brick-lined enclosure is situated on the east of the town, by the side of a mud-brick and mud-built rampart and assigned to Phase II, Period I. Roughly trapezoidal in plan, from north to south it measures nearly 710 ft. and 120 ft. from east to west. Built with baked bricks its extant height is 14 ft. but it might have been originally much higher. There is a large opening, about 23ft. wide, in the wall on the eastern side. This is believed to be the "inlet" channel, whereas on the south there is a smaller opening called, "spill channel" which may have been for regulating the outflow of the water by the insertion of a wooden door in the grooves provided at the mouth. The Sabarmati now flows at a distance of about two miles from the eastern wall of the enclosure. It is possible that formerly, some 4,000 years ago, it flowed much nearer and at high tide, the water could be carried inwards through a specially built canal—which this year's excavation shows was cut into the bedrock and provided with brick walls—to facilitate the navigation of small ships. This would become still more easy, if the *Bhal* area which forms a part of the former Nal Lake (now marshy) was originally a sea.[87]

Whether this enclosure is a dock-yard or something else can indeed be proved by (1) stratigraphically connecting the dock-yard with the present or extinct Sabarmati river, exposing the ancient channel—its sandy banks, etc. (2) by consulting the traditional navigators (*kharvas*) who still ply small boats as well as large in the numerous ports in Saurashtra ; (3) by searching for parallels in Egypt and Crete and Mesopotamia. Unless at least one of these investigations is made, the matter will have to be left in a undecided state, with a statement that there is undoubtedly some evidence to regard the enclosure as a dockyard.[88]

In other ways too Lothal is an exact replica of a true Harappan town. The town folk enjoyed the same prosperity as witnessed at Mohenjodaro, for instance. Fine, well-made, sturdy pottery recalling in shape, designs, fabric and even in the levigation of clay the now famous Indus pottery. But in addition to the beakers, goblets, troughs dishes-on-stand knobbed vessels with flaring sides, perforated jars and lamps in thick red or buff ware, there is a black-and-red or cream ware which is throughout contemporary with the usual ware. While this ware is different in the technique of manufacture, it shows no new forms. Some of the Harappan forms are copied in it.

However, a few new ceramic forms are visible in Period II. These are supposed to be evolved from the earlier ones and virtually ousted the latter. These new forms include a bowl with blunt carinated shoulder, and a simple dish without carination on a squattish stand. Goblets, beakers and perforated jars are absent. While some old designs like hatched and filled triangles and oblong and alternatively hatched squares are common with Period I, some designs[89] such as snakes, very realistically drawn stags and ducks are new. If these and others also occur in Period I, then Lohal

87 As pointed out on p. 57.

88 After these words were spoken, Shri Rao has stratigraphically connected the enclosure with the old river-bed and also consulted the traditional and modern naval engineers. And it is felt that this could be a "dockyard" and it is described as such in his article in *I.L.N.*

89 *I.A.R.*, 1957-58, p. 13, pls. XV A-B, XVII A and XVI B.

should be regarded as not mature or true Harappan but as Wheeler calls it a "sub-Indus" variety.

The regularity in town planning is said to be a feature of Period 1. Later degeneration is evident ; the houses are out of alignment and drains haphazardly laid.

However, till the very last, efforts were made to protect the town from recurring floods by mud platforms, a feature witnessed at Mohenjodaro, Harappa and Rangpur. Right from the beginning houses were built on solid mud-bricks platforms, and every time floods caused destruction, the platforms were raised. In addition the main habitation was protected by a mud-brick rampart.

Ornaments of various types and materials—like shell, ivory, steatite, faience, terracotta, semi-precious stones (agate and carnelian), copper and gold—ornaments, beautifully polished weights, gamesmen, figurines in terracotta and copper, once again testify to the artistic skill of the Indus Saurashtra craftsmen. There is, for instance, a small copper dog: even though now encrusted, it has a beautiful expression. And the golden necklace—in 500,000 tiny gold beads with spacers.

While these evoke our appreciation, a few objects found very recently advance our knowledge of this civilization. Gamesmen with heads of a ram[90], and ox, are indeed interesting in themselves, but also take back the antiquity of similar pieces in the game of chess. For all we know, these gamesmen might belong to the game of chess, or a game very similar to it. A game board for such a game has been recovered from the Royal Graves of Ur.[91]

Well aligned streets and houses could not have been built without some instruments like foot-rule and compass. Now fortunately a small measuring rod of ivory[92], about 7 in. long, graduated along the upper margin, each division about 1.7 mm.[93], has been found, and a peculiar object,—like a *yoni* (if looked from one side only) but identical in shape on all the four sides—may be a compass for mersuring angles. With these also may be noted terracotta plumb-bobs of different sizes with or without vertical robs.

Important too is a twisted copper or bronze drill. Its occurrance at so early a date is of great moment in the history of civilization.

The occurrance of a terracotta figure of a horse[94] or horse-like animal—the thick, unmistakably that of this animal, whereas the face and head are very much like it—is very significant. If found from the mature Harappan deposits of Period I[95], then all the arguments regarding the authorship of the civilization based on the existence or non-existence of the horse in this Indus Civilization will have to be revised, unless of course, the animal is not a horse, but an onigar—wild ass—which still survives in the Little Rann of Kutch and north-west Saurashtra.[96]

90 *I.A.R.*, 1959-60, Pl. XVI, A.

91 Woolley, Leonard, C., *Ur of the Chaldees*, pl. V (C), and Woolley, C.L., *Ur Excavations*, Vol. II, "The Royal Cemetery" pl. 95-98.

92 *I.A.R.* 1959-60, pl. XII B.

93 *Ibid.*, Pl. A., second row from top, centre.

94 *Ibid.*, pl. XV E.

95 Shri Rao kindly tells me that one is from Period I, and the other is unstratified.

96 This suggestion was made by Professor F.E. Zeuner and later he and Dr. B. Subbarao specially went to see the onigars in their present natural habitat.

The discovery of the cemetery in the south, on the lower part of the mound, almost level with the surrounding plain confirms once again our views regarding the methods of disposal practised by the Harappans.

Until early 1960, some 17 graves or burials have been found. Stratigraphically, *it appears*, these are assignable to Phase III-V, that is the closing part of Period I and the whole of Period II (which has only one phase, viz., Phase V).

The method of burial seems to be simple; a fairly large pit was dug and the body put in a north-south direction with the head to the north, placed on a slightly raised ground, and the face in some cases turned to the east, exceptionally east-west. But in one case (Phase III, Period I), the pit was lined with mud-bricks, which suggests that shrouds, coffins or built-in chest-like contrivances were probably in vogue. It may be recalled that at Harappa, Wheeler found the traces of a wooden coffin and the bodies covered by a reed shroud.[97]

In 1955-56[98] three instances of earthen pots containing crushed bones, some pottery and a carnelian bead were noticed at two places in the excavation. It is difficult to say whether these are examples of urn burials and if so of children who were very often buried in pots right in the houses.

Normally each pit contained one skeleton, but in three cases, all of Phase III, two bodies were placed side by side.

This is indeed an interesting, nay remarkable, exception, but cannot be called a *Sati* as Shri Rao thinks.[99] For the practice of *Sati* connotes a very highly specialized conception—voluntary selfimmolation by the wife after her husband in the same funeral pyre. Thus, burials are automatically ruled out, and would rather suggest a practice which was in vogue in Iraq or Mesopotamia, viz., ceremonial burial of the wife or servant, or better dependent, after the husband or the master. Thus to describe the Lothal twin burials as *Sati* is not proper. It is an anachronism.

These three twin-burials were devoid of any grave goods—mostly pottery—because possibly there was no room. But the single graves were provided with a number of pots,[100] though very often[101] (when disturbed) a single dish-on-stand and a vase with round base or a high-necked jar only are found.

Period II at Lothal is not only remarkable for the general decadence of the Harappan way of life, but for the appearance of new pottery shapes, designs and blades of jasper and agate.[102] The last two provide a probable explanation for the deterioration in the Harappan Culture. Flint blades have uniformly characterized the Harppan Civilization whatever it is found, even as far as Alamgirpur, and Lothal. At both these places flint is not locally available. It must have been imported from Sukkur and Rohri—an inference which can be fairly well established if the specimens from both the areas are found to be identical on petrographic examination. This source seems to have been stopped for some reason. The newcomers—influence or people—

97 *A.I.*, No. 4, 1947, pp. 87-88. Burial No. 5 in Cemetery R. 37 found in 1946.
98 *A.I.R.*, 1955-56, p. 6. pl. VII B.
99 *I.A.R.*, 1958-59, p. 14.
100 *I.A.R.*, 1959-60, p. 18.
101 *Ibid*., 1958-59, p. 15, pl. XX A.
102 *Ibid*., 1959-60 p. 18.

used instead blades of another fine-grained material, jasper, chalcedony, agate—a feature which marks *all* the later Chalcolithic cultures of Saurashtra including Rangpur, Rajputana, Central India and the Deccan (except Karnatak, viz., Maski). Though the technique probably remained the same, the blades are smaller in length and breadth because the cores are small, much smaller than those of Sind.

This new influence seems to have spread or arrived gradually—almost infiltrated—both at Lothal and Rangpur. But before it could established itself at Lothal, the later was destroyed by severe floods and abandoned. Rangpur continued to exist, but in a different form.

Who these new people were, we do not know. Nor do we know whether the contact with Sind was stopped because in the latter itself the Harappan civilization was being destroyed by nature and man. However, a guess may be hazarded. Three terracotta horses were found last season (1959-60) at Lothal. It is not mentioned to which period they belong. But if they belong to Period II[103], then the horse seems to have arrived with the new elements. It also appears in a small terracotta fragment[104] and in a stylized painting[105] on pottery from Rangpur.

Rangpur

Rangpur in north-eastern, Rojadi in central, Somnath or Prabhas in southern, and Lakha Bawal—Amra—in western Saurashtra carry forward the story interrupted at Lothal. These are but a few well-known sites. As mentioned earlier, each is representative of a cluster[106] of Harappan and later settlements in Saurashtra.

The topographical features of Rangpur[107] are not much different from those of Lothal from which it is 30 miles to the north-east. Situated on the Bhadar river in the former Limbdi State, it is about 3 miles from Dhandhuka Railway Station. Often tapped, but not sufficiently fully, we have so far no clear picture of the various town or village plans or houses. However, the culture sequence it provides is interesting. Three main cultural periods have been observed. The earliest is quite significant—microliths in a sandy river deposit. Over this took place the mature or probably a late phase of the Harappan one. It exhibits all the characteristics typical of this civilization—brick structures, drains, mud-brick fortification (or rampart ?), pottery, ornaments, tools, weapons and weights. Yet, so far, the seal or sealings and figurines of mother goddesses etc. have not yet turned up. Among the pottery shapes and designs is a bowl with a low stand and a peacock painted in black over a red surface.[108] While the design is typically Harappan, the ringed base seems to herald later features noticed in Period II.

Without apparent signs of destruction by flood, fire or force in Period II, one wit-

103 But see footnote 96.

104 Dikshit, M.G., *op. cit.*, pl. XVII, p. 51, and other earlier references.

105 *Ibid.*, Pl. XII, I, p. 41. (It has been described as a palm "frond" design, but Professor Mallowan, on seeing it with the writer in the Institute of Archaeology, University of London, in 1951, immediately said that the design looked like a horse's head with mane.)

107 *I.A.R.*, 1953-54, p. 7 and 1954-55, p. 11.

107 For sites near Rangpur, see *I.A.R.*, 1954-55, p. 59 and 1956-57, p. 80.

108 *Ibid.*, 1954-55, pl. XII A.

nesses new pottery fabrics, shapes and designs. The earlier brick houses seems to give place to those of mud-brick. The blades are of jasper, etc. instead to flint.

New cultural elements seems to have taken a peaceful possession of Rangpur and mixed with the already existing culture. Even this is given up in Period III, Bowls with fine red lustrous surface, thin walls, a short solid stand are the striking feature of the pottery.[109] These and others are painted with highly stylized deer motive,[110]— chair-like legs and wavy horizontal horns"—the buckranian[111], and a design which, though described as a palm "fronde", is in truth a horse's head with mane.[112] Alongside this is another pottery, a back-and red ware with paintings in white.[113]

Rojadi and Others

Rojadi and Adkot[114] on the Bhadar river (34 miles south and 30 miles south-east of Rajkot) and Pithadia[115], a further 10 miles away, tell a slightly different tale. The first had a protection of large boulders—quite a new feature in the Harappan—while the rubble structures appear in Phase C, and alongside a few Harappan shapes the characteristic Prabhas ware also becomes current.

Pithadia had in the later phase the lustrous ware of Rangpur.

Thus already a co-mingling of several cultural forces is evident in the heart of Saurashtra.

Somnath

In the south-west the site known as Somnath or Prabhas Patan has been very partially excavated. But the area is very extensive. A group of five mounds known as Nagar, stretched over the Hiranya river for some 3,000 ft. These are two miles east of Prabhas Patan, while the famous temple of Somnath stands close to it.

It appears from the second excavation by the late Shri P.P. Pandya[116] that the entire occupation debris may be divided into six periods, each period having several sub-phases. Since the N.B.P. occurs in Period III B, only the earlier period interest us. Crude sherds of grey and red-slipped pottery with incised decoration and blades of chalcedony found in a layer of sand and gravel characterize Period I A. Late Harappan pottery, mostly painted, occurs in profusion in I B. It is now that the typical "Somnath" or "Prabhas" bowl (with incurved and bevelled rim with panelled patterns) as well as a few sherds with paintings in brown on a white or creamy surface make their appearance. This is indeed an important development, for three distinct pottery groups

109 Dikshit. *op. cit.*, pl. II and *I.A.R.*, 1954-55. pp. 11-12.

110 *Ibid.*, and *I.A.R.*, 1954-55, pl. XII B.

111 *Ibid.*, 1954-55, pl. XII B.

112 Dikshit, *op. cit.*, pl. xii, 1. See footnote 105.

113 Dikshit. *op. cit.*, pl. I and *I.A.R.*, 1954-55, p. 12.

114 *I.A.R.*, 1957-58, p. 18, and 1958-59, pp. 20-21, figs. 9-10.

115 *Ibid.*, p. 20

116 *I.A.R.*, 1956-57, pp. 16-17, pl. XVII and I.A.R. 1955-56, p. 7, also mentions the occurrence of a copper celt, and 10,000 minute steatite beads in a single pot. But these further refer to the association of black-and-red ware in Period I. The later report is here followed.

are present.

A new elephant enters in Period II—the Lustrous Red Ware (of the Rangpur type)—but copying the handled bowl—besides the dish-on-stand and carinated bowl of the Harappan type. A rubble pavement is associated with this phase.

Iron and black-and-red ware in abundance, followed by the N.B.P. in a later phase, seemed to show the priority of the former in Saurashtra as at Maheshwar, Nagda, Ujjain, and now Sonepur, near Gaya, besides Bahal and Daimabad in the Deccan. But how much earlier is the question. Will it mean a century or much more?

Amra and Lakha Bawal[117], nine miles east of Jamnagar, District Halar, along with some 20 sites repeat the Rangpur sequence. Period I seems to be pure Harappan, though at Amra black-and-red bowls are also reported alongside. The red polished ware (probably identical with Rangpur lustrous) and a coarse black-in-red ware occurs in Period II. It is further distinguised by the presence of a gold ornament—earring or head ornament—with exquisite filigree work.

In review then Saurashtra presents a very interesting phenomenon. First the initial arrival and spread of the Harappans. This was certainly a maritime one, yet, on our showing, from Kutch straight to Lothal or some other site on the eastern coast, but not round the peninsula (or the island?) and up the Gulf of Cambay to Lothal. There is a possibility that an early Harappan site might be found on the Western Coast Whatever be the exact route, the Harappans moved into the interior and spread in all directions. This might be a natural further colonization in the wake of the destruction of other settlements in Sind and Lothal, etc. Wherever they went, they carried their art of pottery. But very soon three other elements (shall we say people?) representing the Lustrous Red Ware, the Black-and-Red Ware with paintings in white and the Prabhas Ware came on the scene. Whence? We do not know. But they all intermingled, and what is definite and significant is that none of them carried the art of building in baked brick and none was literate. Even in other arts and crafts they were deficient. Thus Saurashtra once again sank to a pastoral-cum-agricultural stage, after the sudden imposition of urbanization by the Harappans.

Significance

A few new features as well as the significance of the widening horizon of the Indus Civilization may now be briefiy brought out. The Indus Civilization has come to the frontiers of Bombay and it is quite possible that with further explorations we may be able to go along the coast still further southwards. If this prophecy turns out to be true, then at least one part of Rev. Father Heras's forecast will be proved. He had said long ago, before even he completed the study of the seals of the Indus Civilization[118], that this culture had spread from the south all along the West Coast over Saurashtra, Sind, the Punjab and then gone over to Western Asia as far as Crete and the Mediterranean countries.

But to prove that the origin of this civilization lay further south and then went northwards, we have to find still earlier cultures in South India showing a discinct

117 *I.A.R.*, 1955-56, p. 7.

118 Heras, H. *Studies in Proto-Indo-Mediterranean Culture*, Vol. I, Bombay, 1953.

affinity to the Indus Civilization. Unfortunately this is not so according to our present evidence and, therefore, Father Heras's hypothesis of this being a purely indigenous culture remains unproved. However, I must say, as I have been saying, that his is so far the only attempt by which archaeological evidence from Western Asian countries and Indian sources is harmonised. How far this will be in conformity with the final reading of the Indus seals one cannot say. But very often working hypothesis have led to some kind of truth and it is possible that Father Heras has indeed struck upon a partial truth.

Again the link between India and Western Asia has also been supplied by the discovery of Indus-like seals[119] in the island of Bahrain in the Persian Gulf. From the distribution pattern of this culture in Saurashtra and the likely possibility of there being a port at Lothal and elsewhere in Saurashtra, it is quite possible now that the Indus Civilization was a maritime one and not merely land-locked. If Indus ports are adequately explored, as Wheeler suggests, then some more tangible links with Western Asia might be had.

Rajputana—A Sea

In this connection I also want to tell you of the researches of one chemist, Dr. Godbole who was till recently Development Commissioner in Rajputana for some years. He took a number of samples from the borings in the wells in Rajputana and has proved quite conclusively that the salt that is to be found in the wells of Rajputana is sea salt and not merely surface salt that has been blown over by the south-west winds over the desert. From this he further infers that Rajputana was a sea during the time of the Indus Civilization and perhaps much earlier.[120a] This also supports the theory of some geologists that during a still earlier geological period an arm of the Arabian Sea went along where the Vindhya hills now are and it is this sea which has given us the beautiful sandstone formations running from west to east in Central India. This sea retreated later and Rajputana became almost a desert. This is a very interesting theory and I wish that some more steps are taken to prove it. If all these explorations and excavations prove the existence of a Rajputana Sea, then the Indus Civilization might have come *via* this sea and not *via* the Arabian Sea round the west coast of Saurashtra but immediately to the north-east coast of Saurashtra which is now formed by the Nal lake. The latter was then under the sea. This also explains the existence of a mature form of Harappan Culture at Lothal. For, from here, it seems to have spread further southwards.[120]

119 *Illustrated London News*, 4th and 11th January 1958, and *Antiquity*, Vol. XXXII, 1958, pp. 243-46. The latter also publishes views of Col. Gordon and Sir Mortimer Wheeler. Wheeler states on the authority of Professor Mallowan that, though these do not show clear affinity with the Indus seals, still nothing like these Bahrain seals been found in Syria or Iraq. The seals thus are India-oriented. In his latest book *Early India and Pakistan*, p. 111, he calls them the "Persian Gulf Seals".

120 Shri Rao, in his letter of 7-12-1960, accepts my suggestion, regarding Saurashtra being an island, and Lothal being directly occupied from Kutch, but thinks that the later movement was round the coast of Saurashtra. This can only happen if owing to climatic, geologic and other reasons the direct route was closed.

120a This view is now not accepted. See Subrata Sinha—Origin of Salinity of Rajasthan "Salt Lakes" in Ecology etc. of *Western India*, ed. by Agrawal *et al*, Delhi, 1977.

Ancient Name of West Coast or Indus Civilization

Another interesting evidence is that which is found in the Babylonian texts. These consist of inscriptions of the kings of Akkad and lexical texts. Among these Mr. Leemans has found two words, viz., '*Magan*' or '*Makkan*' and '*Meluhha*'[121]. He identified *Magan* with Makran in Baluchistan and *Meluhha* with Western India including Sind and Saurashtra. From Meluhha, it is said in these texts, that carnelian and special kinds of wood were imported all along the sea by the Babylonians. If this inference of Leemans is correct, then we find for the first time an ancient name for part of Western India. What is now necessary is that we should read our ancient literature—*Puranas* and things like that—and find out if some such word comparable to the Babylonian one can be found in them, which from its geographical position would suit the context.

End of the Indus Civilization

Sir Mortimer Wheeler's excavations at Harappa and Mohenjodaro[122] indicate that this civilization was not non-violent as it was believed by Marshall, but it had fortifications around the important buildings called 'acropolis'. And from this it is further inferred that these cities are indeed the *puras* of the pre-Aryans. This is a very tempting hypothesis. But unfortunately we have not found anything "Aryan" on the ruins of the Indus Valley Civilization. The Cemetery H at Harappa gives us a kind of culture which as shown by Shri Lal[123] does not immediately over-lie the ruins of the Indus Civilization and thus it does not seem to be of the invaders.[124] Sir Mortimer therefore has not pressed this point in his latest book,

However, our studies of the pottery from Central India, Bikanar and then of the Cemetery Hindicate that there is some similarity between the pottery of these regions and it is possible that all these belong to groups which were related to one another in some way. In particular, a big painted lid covering a huge burial urn from Cemetory H (now exhibited in National Museum, New Delhi) appears to be identical[125] in fabric and decoration with the one from Rangmahal (examined by me and Dr.

121 Leemans, W.F., "The Trade Relations of Babylonia", in *Journal of the Economic and Social History of the Orient*, Vol. III, April, 1960, pp. 20-37. Prof. Glob, actually identified Meluhha with the Indus Civilization itself. *Illustrated London News*, January 11, 1958, p. 55. Oppenheim's review "The Seafaring Merchants of Ur" in *Journal of American Oriental Society*, Vol. 74, 1954, p. 6 ff, is very useful.

122 Wheeler, Sir Mortimer, *Indus Civilization*, Cambridge, 1953.

123 Lal, B.B., "Excavations at Hastinapur" in *A.I.*, Nos. 10-11, 1954-55, p. 151, fn. 1.

124 *Early India and Pakistan*, pp. 113-14. He has on the contrary described the decay as gradual, a fight against nature—recurring floods and partly desiccation. Thus "Mohenjodaro was wearing out its landscape".

125 After writing this in the subsequent visit to Delhi both these lids—one from Rangmahal and the other from Cemetery H—were brought together (with the permission of Shri Ghosh and the authorities of the National Museum) and compared it was then found that though the similarity in fabric, type and decoration were close, there were a few differences. But one can safely say that the Rangmahal type could be deprived from that of the Cemetery H.

Subbarao with the great kindness of Shri A. Ghosh) in Bikaner, Though the latter is non-stratified, it points to the fact that the Cemetery H pottery types and fabrics are not confined only to Western Punjab, but can also be found in Rajputana. Thus one of the arguments against Wheeler's Aryan invasion theory can be partly met, For what happened in the Punjab seems to have later taken place elsewhere.

Thus every year more and more information is being obtained about the Indus Civilization. But the time has not yet come, when we can say something definite about it, and I am sure that unless a very well-planned attempt is made to get such information, we shall have to remain content with these tit-bits. What is required is a planned exploration in Bikaner followed by a large-scale excavation, and then alone we shall be able to solve the problem of the relationship between the Indus Civilization and the later Chalcolithic cultures of the Gangetic Valley, Rajputana, Saurashtra and Central India.

Origin

If we do not know the exact cause or causes of the destruction of the Indus Civilization, do we know anything about its origin ? No. But the work of Fairservis[126] and Beatrice de Cardi[127] in Baluchistan, particularly the former, has given us a faint idea of the earliest pastoral-cum-agricultural cultures in the Quetta Valley; carbon-14 dates place Kili Gul Mohummad around 3500 B.C., Damb Sadaat I-III between 2400 and 1500 B.C. and Kot Diji I-II which appear to be Harappan are dated io about 2500 2.3.[128] This is also the revised "traditional" date of the mature Harappan Civilization. Kot Diji (as well as Harappa), if systematically dug, from the hitherto brief reports, promises to tell us of the origin or earlier phases of the Harappan culture.

Protohistory: Gangetic Valley and Peninsular India

These 20 years, nay the last ten, have witnesssed a phenomenal increase in our knowledge of the protohistoric cultures of what is technically called "the Peninsular India". The large areas, called, *Janapadas* in Sanskrit and Buddhist literature, outside the Indus Valley proper, were literally a *terra incognita* from the archaeological point of view. These presented a dark spot until they were lighted up by the strong and sudden light from the Ashokan edicts in the 3rd century B.C. Thus practically the present post-partition India (or, geologically, the Gangetic Valley plus the Old Indian land mass upto Kanyakumari in the South) was believed to be historically blank. Of course, the Buddhist Jatakas did describe in glorious terms the activities of the 16 *Janapadas*

126 Fairservis, Walter A., Jr., "Excavations in the Quetta Valley and Archaeological Survey in the Zhob and Loralai Districts, West Pakistan" in the *Anthropological Papers of the American Museum of Natural History*, Vol. 45, pt. 2, pp. 169-401; and Vol. 47, pt. 2, pp. 277-448 respectively. These have made the earlier studies of surface pottery by McCown, Piggott and Gordon obsolete.

127 Beatrice de Cardi, "Fresh Problems from Baluchistan", *Antiquity*, Vol. XXXIII, 1959, pp. 15-28.

128 *American Journal of Science*, 1959, pp. 52-54, Radio Carbon Supplement, Vol. I.

stretching from Ujjain or Avanti (Malwa) in the west to Mithila (Bihar) in the east, in about the 6th century B.C. when Buddha and Mahavira preached in Magadha. The later Vedic literature and the *Puranas*, on the other hand, sang of the exploits of various Aryan and semi-Aryan tribes and the colonization by the Yadavas in Saurashtra, in Vidarbha and in the Narmada Valley. Thus our historical tradition gave ample proof of the kingdoms and peoples in what is now known as Assam, Uttar Pradesh, Madhya Pradesh, Rajputana, Maharashtra (Vidarbha), and Gujarat (Saurashtra) though Mysore-Karnatak, Andhra, Madras and Kerala were unknown, save for occasional references.

However, in the absence of any tangible archaeological evidence, we could not visualize at what stage of civilization these kingdoms were—whether they knew iron or whether they were in a Copper or Stone Age and how they stepped into the Iron Age or an urban stage from a purely pastoral-cum-agricultural stage. South India, it was thought (on no evidence at all), had by-passed the Copper Age and reached the Iron Age in the 3rd century B.C.

This darkness which intervened between the earliest historical period and the Indus Civilization on the one hand, and between the former and the undefined Stone Ages in Peninsular India has now been dispelled, first by Wheeler's work at Brahmagiri and by the work of the Deccan College at Nasik and Jorwe. Those initial discoveries, particularly those at Jorwe, supplied the clues, viz., microliths of a particular nature and pottery, with which to search for the Chalcolithic cultures in the Deccan and elsewhere. Planned surveys brought to light more and more sites in Khandesh, Central India, Malwa and Saurashtra.

In Rajputana, Sir Aurel Stein[129] had already shown the existence of the Indus Valley and allied sites in the dry bed of the Ghaggar in Bikaner State. This view was confirmed by Shri Ghosh's exploration including trial excavations in Bikaner in 1950-53 and further pointed to the extension of this civilization in the valleys of the Drishadvati. Unfortunately no report[130] of this exploration has so far been published, nor was the work followed up by an excavation, so that the picture is still hazy. In South-Eastern Rajputana, however, traces of other Chalcolithic Cultures have been unearthed.

Wheeler[131], while departing from India, had suggested that we in India should turn to the Gangetic Valley. For the Ganges had given us our faith, whereas the Indus had given India its name. This suggestion was indeed prophetic. For the entire Gangetic Valley, from Hastinapur, the ancient Mahabharata capital in the north-west (and beyond), to Kausambi in the east, has given evidence of a pre-Buddhist Culture. Futher eastwards in Magadha (Bihar), Assam and then south-eastwards in Orissa and Andhra, stages of cultures much earlier than the urban are beginning to unfold,

129 For reference see below.

130 Since writing this we had an opportunity to go through the large mass of pottery and other finds collected by Shri Ghosh, as well as splendid photographs of various sites and classified objects including pottery. From this it would appear that considerable work has been done towards the preparation of the final Report. If this could be soon published, many scholars will profit by this excellent and pioneering work.

131 *A.I.*, No. 5, 1949, p. 10.

Barring therefore Kerala and the West Coast, south of Bombay, cultures called "Neolithic" or Chalcolithic (according to the nature of the remains) existed, either prior to or contemporary with the great Indus Civilization. In some regions, like the Narmada Valley these might have immediately succeeded this civilization or been its junior contemporary.

However, this much is certain that the rest of India, south of the Punjab and Sind was not totally a blank. Small and large river valleys were dotted with a number of peasant village cultures. And it is these which served as a bridge between the later city civilization of the historic period and the earlier Stone Ages.

How did this happen? What influences were responsible for this revolutionary change? It is also asked whether some of these Neolithic and Chalcolithic cultures themselves were not introduced from outside? And if so, whether these had any bearing on the geographical situation of the various regions mentioned above, or their birth and growth was uniform, irrespective of geographic conditions.

Painted Grey Ware or the Gangetic Culture

Before discussing the problems of origin and diffusion of these newly discovered cultures, let us see their main characteristics. Proceeding from north to south, the first is the Gangetic Culture. Its main characteristic so far is the peculiar grey colour of the pottery met with in all the excavated and explored sites. This is often painted in black and hence is called the "Painted Grey Ware Culture" and included in the Ganges Civilization.[132] This pottery was first found at Ahichhatra[133], District Bareilly U.P., in 1940-44, in the lowest layers, but its full significance was not then realized. Later it turned up in the excavations at Hastinapur[134], at Rupar[135] further up on the Sutlej, at Purana Quila, New Delhi, then in the core of the rampart at Ujjain[136] in the soutn, at Mathura[137], in Period I at Sravasti[138], and in the predefence deposit at Kausambi.[139] Thus its stratigraphical position is now well ascertained. Its greatest concentration in the Ganga-Yamuna Doab, the Aryavarta or Madhyadesha of the *Upanishads*, the *Puranas* and the Epics is well attested by later explorations. Occasional sherds have been found so far south as Ujjain in Central India, Chosla[140] and Gondi[141] in Ajmer and Jaipur, besides Bikaner (where there were small settlements) in Rajputana and in the east upto Vaisali in Bihar and in the north at Madhopur[142], 15 miles south-west of Jullunder. These far-flung places show the contact which the Grey Ware people had with the cultures in the Punjab, Rajputana, Malwa, Eastern

132 Wheeler, Sir Mortimer, *Early India and Pakistan*, p. 129.
133 *A.I.*, No. 1, 1946, pp. 58-59.
134 *Ibid.*, Nos. 10 and 11, 1954-55, p. 11.
135 *I.A.R.*, 1953-54, p. 6.
136 *Ibid.*, 1956-57, p. 2I.
137 *Ibid.*, 1954-55, p 15.
138 *Ibid.*, 1958-49, p. 48.
139 *Ibid.*, 1957-58, p. 47.
140 *Ibid.*, 1958-59, p. 45.
141 *Ibid.*, 1958-59, p. 12. pl. X A. (The fabric is coarse).
142 *Ibid.*, 1956-57, p. 79.

U.P. and Bihar. The frontiers of the Narmada and the region south of it seemed to have remained completely unaffected.

This pottery is very distinctive in its fabric, its forms and its paintings over a slate grey surface. It has generally a fine fabric characterized by a well levigated clay, very compact, and free from impurities, medium-to-thin walled and fully baked. How ever, coarse varieties are also known. The colour, which is almost identical on both the sides, varies from ashy to dark-grey. This is due to the fact that the pots were baked in a kiln where the heat was gradually reduced, so that the clay did not turn red, but it was sufficient to fully bake the pots.

The shapes so far know are bowl· and dishes with (i) straight[143], (ii) convex[144], (iii) carinated[145], (iv) tapering and outgoing,[146], (v) ledged or corrugated[147] sides and with round or sagger base. Vessels are largely wheel-made, though occasionally hand-made varieties are available. They were usually painted with a black colour, but at times in chocolate or reddish brown. A unique specimen is bichrome, having the designs in reddisn brown and cream. Painting was done when the pots were "leather hard", that is sufficiently dry and before firing. The paint is mat, though the surfaces are smooth due to burnishing. The painted strokes are of unusual thickness.

The painted designs include the following:

(*i*) Simple horizontal band round the rim, both inside and outside.
(*ii*) Groups of (*a*) verticals, (*b*) oblique or (*c*) criss-cross lines[148], usually on the outside, but that a t times on the interior.
(*iii*) Rows of dots or dashes or dots[149] alternatively with simple lines.
(*vi*) Chain of small spirals[150] on the outside.
(*v*) (*a*) Concentric circles[151] or semi-circles, and (*b*) sigmas[152] or (*c*) swastikas[153] either on the outside or on the interior of the base.
(*vi*) Rows of scalloped pattern, imitating a 'rising sun' bordering concentric circles[154]—a very rare design.
(*vii*) Rows of circular wavy lines.[155]
(*viii*) Rows of chains bordering a circle.[156]

143 *A.I.*, No. 10 and 11, Fig. 6.
144 *Ibid.*, Fig. 7, (omitting No. 20, which is a rare type and in red ware and painted in black), and Fig. 8.
145 *Ibid.*, Fig. 9, p. 51.
146 *Ibid.*, Fig. 9, p. 49-50.
147 *Ibid.*, Fig. 9, p. 45-46.
148 *Ibid.*, Figs. 6-8.
149 *Ibid.*, Figs 6, 4 aud 12; Fig. 7 and 19.
150 *Ibid.*, Fig. 10,66.
151 *Ibid.*, Fig. 6, 15; Fig. 9, 61.
152 *Ibid.*, Fig. 10, 70.
153 *Ibid.*, Fig. 6, 14; Fig. 10, 64.
154 *Ibid.*, Fig. 10, 67.
155 *Ibid.*, Fig. 10, 68.
156 *Ibid.*, Fig. 10, 65.

Besides the Painted Grey Ware, three or four other pottery fabrics[157] were found in association with it. All these are equally old, but not important at the moment.

Undoubtely the Painted Grey Ware holds a significant position by being placed between the Harappan and the Northern Black Polished pottery, by its specialized distribution pattern within the Ganges Valley, its association with the traditional *Mahabharata* sites, such as Hastinapur, Tilpat, Ahichhatra, and its likely affinity with similar pottery from Shahi Tump (both in fabric and designs, particularly the swastika) Baluchistan and further afield in Sistan and Sicily.[158] Still with all the potentialities it promises the unfolding of an unknown facet of our culture, we know nothing indeed about other aspects of the people who introduced this pottery, and little is done so far to fill up this vacuum.

Insignificant exposures of the Painted Grey Ware levels at Hastinapur[159], Rupar[160] and Alamgirpur[161] suggest that the people lived in mud-covered reed houses, ate rice besides beef, pork and venison and knew copper and the horse. Towards the late phase of their life, iron was introduced. Surely this picture of the people (who are likely to be a group of Aryans and possibly some of them the *Mahabharata* heroes) is wholly inadequate. Without the "area" or "horizontals" excavation which will lay bare a fairly large sector of the Painted Grey Ware habitation, this will remain vague and in a most tantalizing condition.[162]

Southwards and Westwards in North and South Rajputana, it appears that several groups of people or tribes lived, perhaps much earlier than the Painted Grey Ware people. Along the banks of the Sarasvati and Drishadvati—which now disappear into the desert near Hanumangarh and are known as the Ghaggar in Southern Punjab—were a number of cultures of the Indus Valley type or slightly later. So far their existence is known from the sherds collected by Stein and Ghosh in 1941[163] and 1950-53[164] respectively. So far twenty Grey Ware sites have been noticed in the Sarasvati Valley and one in the Drishadvati in Bikaner. But unless futher work is done, nothing more can be said about them.

Ahar Culture

In south-east Rajputana in the valley of the Banas and the Chambal, Shri R.C.

157 *Ibid.*, d. 44, Figs. 11-43.
158 *Ibid.*, p. 33.
159 *Ibid.*, pp. 13-14.
160 *I.A.R.*, 1953-54, p. 7.
161 *Ibid.*, 1958-59, p. 54.
162 After this was written the Archaeological Department, Government of India and the Deccan College have planned to excavate a couple of Painted Grey Ware sites in Bikaner. The former have already begun at Sardargarh and before this book is published, interesting results are expected.
163 Stein, Aurel, "A Survey of Ancient Sites along the 'lost' Saraswati River", *Geographical Journal*, No. 39, pp. 173-82.
164 A Ghosh, "The Rajputana Desert—Its Archaeological Aspect", *Bulletin, National Institute of Sciences in India*, No. 1, pp. 36-42.

Agarwala brought to light a culture which by its characteristic pottery is known as the "Painted Black-and-Red or Cream" or Ahar Culture after the type site Ahar in the city of Udaipur.[165] Since then a large number of sites have been discovered, but the extent of the culture seems to be confined to south-eastern Rajputana[166] comprising the districts of Udaipur, Chitorgarh and Bhilwara with outliers in the adjoining district of Mandasor. But the ware or its variants lad also reached Nagda, Navdatoli on the Narmada, Prakashe on the Tapi and Bahal on the Girna. This distribution pattern is in a sense provisional, because much of the pottery is not yet fully reported, and there are likely to be differences of opinion as to whether a particular sherd belongs to this group or not. What seems to be certain is that the centre of the Ahar Culture was south-east Rajputana.

However, the question from where Ahar or this region derived its peculiar pottery is difficult to answer, unless Ahar itself is more fully excavated, and some absolute established from its earliest phase. The question is further complicated because a a black-and-red ware is found throughout at Lothal. This means that the ware was known to the Harappa Civilization in Saurashtra. It may be that the pottery types of the latter are different from those of the typical south-east Rajasthan and Central Indian group. However, the fact remains that the peculiar inverted firing was known and practised elsewhere, perhaps at an earlier period, which may be around 2500 B.C. Whence did the Harappans of Saurashtra get or borrow this technique?

In our present knowledge, vessels made in this technique first appear at Badari and Der Tasa in Egypt[167], where they are called "black-topped." Formerly this would have been too distant a source, as our pottery was mainly early historical, but since the distance is halved by 2,500 years, the Egyptian analogy is worth investigation.

The mound at Ahar, 3 furlongs from the Udaipur Railway Station, is over 30 ft. high and stands almost overlooking the Ahar river. The Ahar or the Painted Black-and-Red Pottery Culture has some 20 ft. of deposits. Remains of houses at various levels have been observed, but since the excavation was small, only some idea of how the houses were built can be had, but nothing about their plans. It is reported that "the house were built either of stone or of mud-bricks and they were roofed with earth laid on bamboos and wattlel." But it is not clear whether both these methods were simultaneously in use or the houses of wattle and daub preceded the stone-built houses. Whatever it is, the houses of the late phase in Period I were equipped with built-in-storage bins, and had a two-mouthed low-walled *chulah* or hearth.[168] The last feature recalls a similar but large hearth at Nagda and Navdatoli, and may suggest some cultural affinity between the peoples of all the three sites. As at Navdatoli again, (some of) the habitations were destroyed by fire.

From the thickness of the deposits, it is inferred that the habitation continued for a long time. This is not a sure guide, unless it is supported by stratigraphy and also cultural assemblage. The pottery is the principal pointer so far. Variations in its

165 *I.A.R.*, 1954-55, pp. 14-15, pl. XXV.
166 *Ibid.*, 1956-57, p. 8; 57-58. pp. 28 44.
167 Childe, V. Gordon. *New Light on the Most Ancient East*, 1952, p. 34.
168 *I.A.R.*, 1954-55, p. 15, pl. XXV.

fabric denote three phases in the occupation. In the earliest phase, the texture and fabric are coarse, and they are polished on the outside only. In Phase II, the fabric becomes finer and is polished inside as well and outside. It is at this time, it appears, that the vessels were painted usually in white but sometimes in black with patterns of parallel lines and dots. Some kind of "devolution" is supposed to have taken place in Phase III, but "how" is not mentioned.

While black-and-red ware, either plain or painted, seems to have been the "table ware," ordinary red ware bearing incised design on shoulders seems to have been used for ordinary purposes. Phase III seems to overlap with the earliest historical period when ring-wells had become a fashion.

It is indeed surprising that this thick cultural debris should have given only a "couple of microliths." They may denote contact from similar cultures in Malwa, but what were the tools and weapons of the Aharians?

Such a promising site[169] has not as yet been more extensively excavated and the Report on the two sesions' work is not yet published. Without these, it is premature to say anything further on this culture.

South-eastern Rajputana, however, was not a pure island of Black-and-Red Ware Chalcolithic Culture. This is well illustrated by the rather extensive excavations near Gilund, about 45 miles north-east of Udaipur (as the crow flies[170]). Both as regards building methods or fashions, and pottery types and fabrics, other cultural influences—which may signify racial or tribal groups—were at work, either from the adjoining regions of Malwa or from within Rajputana itself.

About a mile off the right bank of the Banas[171], there are two large mounds, 45ft. and 25ft. high respectively, separated by a depression. While both the mounds were inhabited from the Chalcolithic period, the western mound seems to have been abandoned after this period, while the eastern mound cotinued to be lived upon during historical periods.

Four structural sub-periods (or phases) within the Chalcolithic have been noticed on the western mound. Of these, a large enigmatic structure, about 100 × 80 ft., having four parallel north-south walls was joined at the southern end by an east-west wall. There were two more east-west walls parallel to the last, from which another group of three north-south walls emerged. These walls (13 ft. × 5ft. 4 in.) are made of mud-bricks which are laid alternatively as headers and stretchers and cemented with mud. The space between the parallel walls was filled with sand, while some of the inner and outer walls have been plastered with mud mixed with a little of lime.

A mud-brick house with a clay-lined pit (oven ?) was exposed in the second structural sub-period, and the last showed a kind of degeneration by the use of burntbrick-bats, etc.

More interesting and of great significance is the occurrence of a kiln-burnt brick-wall laid over a stone-rubble foundation in another trench called GLD. 3. It is not

169 This opinion was confirmed by a personal inspection of the site in March 1961. In fact it needs a horizontal excavation as it is so vast and holds a crucial position in south-east Rajputana.

170 *Ibid.*, 1959-60, pp. 41-46, fig. 16, pls. XLI-XLVI.

171 The river now flow at a distance, but previously should be flowing much nearer.

yet fully excavated but even its dimensions of 36 ft. × 1 ft. 10 inch. make it a formidable feature of the habitation. The wall was further plastered with a mixture of clay, sand and lime.

What this bricks structure was is not known, as it is not fully uncovered. But to have bricks of the size of 14 in 14 in. x 6 in x 5 in. in a Chalcolithic building outside the Indus Civilization is in itself a very interesting development in our knowledge of the contemporary cultures of the period. Some of the houses—particularly those of mud-brick—were roofed with a mixture of reddish clay or mud mixed with reeds and split bamboos (as it is done today in several villages).

The houses were provided with white-washed earthern ovens, and clay-lined pits, some of which were 9 ft. in length, 6 ft. in breadth, 2 ft. in depth and lined with 1/2 in. thick plaster of white clay and sand mixed with a vegetable fire.

While Gilund has certain features common with those of Ahar—particularly mud-brick houses, built-in storage bins—it also considerably enlarges the picture of the Chalcolithic south-east Rajputana with its huge structures of mud, mud-brick and burnt-blocks. These no doubt imply several types of economic, political and civic factors. This is further corroborated by the ceramic evidence. Unlike Ahar, which has only two pottery fabrics, viz., black-and-red with paintings in white and an ordinary red ware, at Gilund we have a large variety in fabrics and types. Besides the principal painted black-and-red were collected: (1) plain, (2) painted black, (3) burnished grey, (4) red, and a few specimens of, (5) polychrome ware having black, bright red and white on a red background.

The black-on-cream and black-on-red were found in the upper levels and the rest were from the lower levels.

With regard to types in the painted black-and-red and simple black, the recurrent types were bowls and dishes, with designs in white either on the inside or the outside or both. Among other wares the dish-on-stand in the red and black-on-red, the high-necked jar and basin with cut-spout in the red ware, and the lipped (or lugged?) basin and vase with strap-handle in the burnished grey were deserve special notice. Of particular interest is the large cut-spout basin. Such vessels were hitherto rare in India, but a feature of West Asiatic pottery. Fragments of strap-handles and cut-spouted bowls have been found previously at Navdatoli, with which Gilund seems to have some contact. In fact, the excavator dates Gilund between 1700 B.C. and 1300 B.C., because typical Navdatoli cream-slipped ware with designs like dancing figures and spotted animals are found in the topmost levels of Gilund, whereas at Navdatoli they figure Period I and II. Yet, though this may be true, it should not be forgotten that both Gilund and Navdatoli might have got these from a third source. For even at the latter the cream or white-slipped ware is comparatively small in quantity and disappears completely after Period II.

Other objects—saddle querns and rubbers, sling balls, beads of terracotta and semi-precious stones and steatite—are after and types known from other Chalcolithic sites and indicate the methods of grinding corn, methods of warfare and the type ornaments. However, among the terracotta figurines, bulls with prominment and long horns[172]

172 *Ibid.*, Pl. XLVA, 4, 5, and 1-3, respectively.

and games-men with a variety of heads—one having that of a ram—are after the Indus or Harappan tradition, though considerably inferior in workmanship. Curiously very few blades, either of chert or of chalcedony, have been found either at Ahar or Gilund. This might suggest the real absence of the blade industries from these cultures, because copper was plentiful, being more easily available. For, had stone been used, traces should have been there. Beautiful fluted cores of an earlier (?) microlithic culture have been found at several sites on the hilly flanks of south-east Rajputana. So the material was there.

Before leaving Rajputana, it should be mentioned that not only Gilund, but a site at Khurdi, Parbatsar Tehsil, District Nagaur, now in the heart of the desert without any river in the vicinity, has yielded a copper hoard. This includes a flat copper celt, bar celt or square sectioned chisel, concavo-convex thin shaped-edged Indian *parasu* (axe)—like sheets and a complete, large, bowl with a channel spout. (Fig 10). The last seems to be identical in size with the more or less complete form from Navdatoli.

Further the sites of Sothi[173] and Nauhar in the Drishadvati valley, have got coarse white-slipped and Malwa Ware, as a study of Shri Ghosh's collection showed. Thus Rajputana being a halfway house from north to south, seems to be a junction of several Chalcolithic Cultures. Its systematic exploration followed by large scale excavation of such sites as Ahar, Gilund and others to be discovered in future is sure to unravel the relationship and route of these and other new cultures.

Malwa Culture

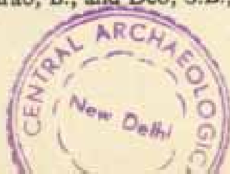
Adjoining Malwa seems to be a bee-hive of activity, all probably characterized by a pale brown or red pottery painted with black designs, and hence called the Painted Black-on-Red Ware or the Malwa Ware. An invariable concomitant of this pottery was a lithic industry, in which parallel-sided blades predominated. Hence it is called the "Short" Blade Industry of the Chalcolithic Period. (Fig. 11).

Up-to-date, two or three sites of culture are excavated. Two or three are in the Chambal Valley, of which Nagda was excavated in 1956-57, whereas Maheshwar and Navdatoli on the Narmada were excavated in 1952-53 and 1957-59. The report of the work at Nagda is not yet published, but that of the first season's on the latter site[174] is available. Moreover, Navdatoli was extensively dug and it gives a fairly good picture of the Chalcolithic Malwa. This is, therefore, described in detail here.

Presumably all these settlements—in Sind, the Punjab, Rajputana, Uttar Pradesh, Bihar, Saurashtra, Central India, Khandesh, North and South Maharashtra, and even in the granitic regions of Andhra-Karnatak were clusters of mud huts (though the Gilund evidence indicates the existence of baked-brick houses as well). But barring Rajputana and the Punjab where the settlements seem to rest on sandy alluvium,

173 Wheeler, (*Early India and Pakistan*, p. 124), thought that the term 'Sothi culture' used by Ghosh, was a little ambitious. Our study shows that the ware is distinctive and a variant, perhaps degraded, of the Malwa ware.

174 Sankalia, H.D., Subbarao, B., and Deo, S.B., *Excavation at Maheshwar and Navdatoli*, Poona and Baroda, 1958.



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elsewhere they are on a black soil. This may imply a clearance of the jungle, the black soil itself being a weathering *in situ* of the brownish alluvium, owing to thick vegetation. This is clearly demonstrated at Navdatoli and Nevasa, the two sites which have so far been horizontally excavated and of which the writer has first-hand knowledge. Navdatoli is situated opposite Maheshwar on the Narmada, about 60 miles south of Indore. Both these sites stand on an old crossing of the river, which itself is a great commercial artery dividing India into two—Northern and Southern.

This black soil—at Navdatoli, a small hamlet now occupied by boatmen (*navdas*)[157] —covers a fairly large area, about 2 furlongs by 2 furlongs, and caps the top of four mounds which some 4,000 years ago probably formed a single unit, but was later cut up by erosion. This single mound represented the topmost terrace of the Narmada; the river itself presumably was flowing at the foot of its northern extremity, though now flows at a distance of about three furlongs to the north.

The present village of the *navdas* is situated on a still younger terrace.

Excavations on all the four mounds indicate that the entire pre-historic mound was occupied, but that some of its parts might have been occupied later than others. For instance, it was revealed last season (1958-59) that the north-eastern extremity of Mound IV was not inhabited before the end of Period II within the Chalcolithic.

From the very beginning the inhabitants built round and square or rectangular huts. These houses were framed by thick wooden posts. Around these were put bamboo screens, which were then plastered with clay from outside and inside. The floor was also made of clay mixed with cowdung. Both were then given a thin coating of lime, so that the house when first built must have looked spick and span. The size of the largest rectangular room was 20 feet by 40 feet. But sometimes, a circular hut was only three to four feet in diameter, the largest being 8 feet in diameter. So it is doubtful, if it (the small one) was meant for habitation. Such small huts might have been used for storing grain, hay, etc. as the writer recently saw some in Kurnool, Andhra State. But normally in Period II, the size of a room was 10 ft x 8 ft. How many persons lived in a room or a house can only be guessed. But possibly not more than four in a room of 8 feet x 10 feet. Secondly, the settlement was so often rebuilt as evidenced by house floors that it is difficult to distinguish the house plans by mere occurrences of postholes. But judging from the modern village of Navdatoli, one may guess that the prehistoric village might have had about 50 to 75 huts, supporting a population of 200 persons.

In one house was found a well-made rectangular pit in the midst of it. It sides are slightly bevelled ; all round there are postholes ; on either side, at some distance, is a pot-rest made into the ground, and possibly the remains of a single-mouthed hearth. Inside the pit were found two logs of wood, placed almost at right angles and the remains of two unique pots. These have a high corrugated neck with everted rim, a ribbed ovalish body with one or two incised bands, filled in with lime and a high hollow base (which looks similar to the mouth, so that until we could reconstruct the

175 This does not imply that the old village was of fishermen or boatmen as Wheeler (*Early India and Pakistan*, p. 142) says.

the pots from this pit we were not certain which was the mouth and which the base).

These houses were built very close to each other. But between a row of 4 or 5 houses, it appears there was an open space, like a *chowk* (square).

Theses were furnished, as it is to be expected at this time, and as we find in a farmer's house even today, with small and large earthen pots for storing, cooking and drinking. The large storage jars were strong and sturdy but generally decorated with an engraving or applique work along the neck. But what surprises us and delights our eye is their "table service", or dinner set. It is this which distinguishes these Early Navdatolians from the modern primitives like Santals and other tribes in Chota Nagpur, for instance. The Navdatolians had a large number of pottery vessels which according to their fabric, shapes and designs fall into four distinctive groups, each having certain shapes and designs associated with a particular period. The most common is a pale red slipped fabric with paintings in black over it. Since this occurs throughout Malwa (an old geograpical name for parts of Central India), it is called the Malwa Ware. This occurs as a major pottery fabric right from the first occupation and runs through the entire Chalcolithic habitation. However in the earliest period only certain shapes and designs figure, both becoming more varied later.

Then there is a sprinkling of black-and-red ware, with paintings in white, comprising generally bowls (with gracefully inturned sides) and cups. This fabric is confined only to Period I and seems definitely to be an import from the adjoining region of Rajputana, where at Ahar it occurs in profusion.

The third important fabric is the white-slipped one. It is associated with the first two periods only. but died out later. It has several gradations in slip and texture, but the finest is smooth, lustrous and slightly greenish-white.

Though it copies some of the shapes of the Malwa Ware. its own distinctive shapes are a shallow dish with broad, flat rim and stand, and a high concave-walled cup with bulging bottom. An almost complete bowl of the latter in fine white slip recalls a similar vessel from the earliest period at Sialk, in Iran (Ghirshman, *Fouilles de Sialk*, Vol. I, Frontispiece, 4). A band of running antelopes and dancing human figures seem to be characteristic designs in this fabric.

In Period III occurs, for the first time, a new fabric called "Jorwe" after the "type site" in the Deccan.[176] This has a well baked core with a metallic ring and a matt red surface. Comparatively limited numbers of shapes and designs figure in this ware. It is also at this time that the most distinctive form of a vessel occurs. This is the Channel-spouted or teapot-like bowl. It is in Malwa fabric. In 1958-59 we were lucky in getting a complete bowl, which leaves no doubt about its shape and function. It seems to have been a vessel with which ablutions were performed. Since it is without a handle, it has got to be held in the palms of both the hands, and the contents (liquid) poured slowly, as in a sacrifice or some such ritual. In order to control the flow of the liquid, a hole was sometimes made at the junction of the spout

176 Sankalia, H.D., and Deo, S.B., *Excavations at Nasik and Jorwe*, pp. 147-51, Poona, 1955.

and the body of the vessel. A similar contrivance may be noticed in the channel-shaped bowls from Western Asia.[177]

Besides this important change in pottery, there was another very significant change in the life of the people. For the first couple of hundred years, the inhabitants principally ate wheat. But now other grains, rice, lentil (*Masur*) (*Lens culinaris* Medikus *mung* or green gram (*Phaseolus radiatus* L.), peas, (*vatana* or *mutter* (*Lathyrus sativus L.*) and *Khesari* (*Lathyrus* sp.) formed the regular diet of the people.[178] These are the grains which are grown and eaten in the Nimad District today. Our discovery, the first of its kind in India, shows that the food habits of a section of the people of Madhya Pradesh are at least 3,000 years old. Though wheat was known before from Mohenjodaro, these are the earliest examples of rice,[178] gram, *masur*, *mung*, *kulathi*, beans and linseed. And though we do not know how these grains were cultivated, for no ploughs have been found, a number of heavy stone rings, which have been discovered, might have been used as weights for digging sticks, as is still done by some primitive people in Orissa. Still it is obvious that a people who ate so many types of grains and had such a variety of pots and pans, indicating varied needs and uses, were not so primitive as some tribes today.

The stocks of the grains were probably cut with sickles set with stone teeth, as thousands of such stone tools have been found. The grain might not have been ground into flour, but merely crushed, either dry or wet, in deep, basin-shaped stone *patas*, called querns in English, with the help of a pounder or rubber. The resultant bread would be unleavened, as it is prepared even today in several part of India. A number of these querns were found, as they were left by their users, right on the kitchen floor; near *chulas* or hearths. The latter again were quite large, made with clay and thinly plastered with lime. It is however not to be presumed that the inhabitants were strictly vegetarians. In the debris of their houses, have been found remains of cattle, pig, sheep, goat and deer. Except the last all must have been domesticated and eaten. But since the grains were varied and plentiful they relied less on animal food, and hence their remains are comparatively few in number as compared to those from Nevasa.

Economically, thus, the early inhabitants of Navdatoli were fairly well off. They were essentially farmers or peasants though a section might be living by hunting and fishing. They did not yet know iron; copper they used, but sparingly in the shape of simple, flat axes, hooks, pins and rings. In a later phase possibly they used daggers or swords with a midrib, as suggested by a fragment found in 1958-59. So for their daily needs of cutting vegetables, scraping leather and piercing stone, they had to rely upon stone tools; their blades are so small that we call them "Microliths". These were hafted in bone and wooden handles, as we nowadays fix an iron blade into a penknife. Among ornaments, we have thousands of beads of sand coated with a glaze and called

177 A mentioned earlier, (p. 51) an identical vessel in copper from Khurdi, Nagpur District, is exhibited in the Sardar Museum at Jodhpur.

178 Another interesting grain is linseed. This is being studied in the Palaeo-botanical laboratory in the Birbal Sahni Institute at Lucknow.

178a Impressions of rice husks on pottery from Lothal are now identified. If this potsherd belongs to period I, then the antiquity of rice might go back to 2,000 B.C.

"faience", or chalk and a few of semi-precious stone such as agate, and carnelian. These must have been strung into necklaces. Bangles and rings were also worn. These were of clay and copper.

These earliest farmers in Madhya Pradesh lived, as we know from Carbon-14 dates, kindly supplied by the Pennsylvania University, about 2000 B.C.[179] and continued to live on with three major, destructions by fire at least up to 700 B.C., when an iron-using people from Ujjain and possibly further North wiped out their existence and laid the foundation of a new economy in which iron, minted money, houses of bricks and altogether a new pottery played a dominant part.

The question who the first dwellers were, whose remains are found all over Malwa, is not yet resolved. Probably, they were a people from Iron, as their pottery shows. This is a very important and interesting clue. In that case, they might be a branch of the Aryans. This trail is to be followed up by further detective work across India and Pakistan up to Eastern Iran.

Not only Navdatoli gives some idea of the life in Southern Malwa, but its series of Carbon-14 dates help in dating similar cultures in Rajputana, Saurashtra, Khandesh, Maharashtra, and Andhra-Karnatak.

Chalcolithic Culture of the Deccan

Now pottery and blades of the Navdatoli type have been unearthed at Prakash[180] in the Purana-Tapi Valley and further south at Bahal[181] in the Girna Valley, whereas surface explorations have revealed scores of sites in East and West Khandesh. This leaves little doubt that contemporary with Malwa, this region was inhabited. And now the question is "Are these cultures of the Deccan in any way earlier than those of Malwa? Has the culture movement been from north-south or was it two-way *all the time*?"

Till now we do not know the main focus of the Malwa Chalcolitic Culture. It would however, appear that it had reached its fullest expression as far south as the Narmada, but its outliers had crossed the Tapi-Girna Valleys and reached as far[182] as the Pravara-Godavari, where it met another Chalcolithic Culture which had spread all over the Deccan and Mysore plateaux. Again we do not know the source of this culture, but it seems to have its roots in the purely Neolithic Cultures of south-east India.

If the evidence from Daimabad near Belapur, Ahmadnagar District, is any guide, it appears that the first wave of Central Indian Culture which reached the Narmada

179 The earliest carbon-14 date is 3,503+128. Stratigraphically this belongs to Period III. It is therefore, presumed that the first two phases, having several floor-levels, might go back to this date.

180 *I.A.R.*, 1954-55, p. 13.

181 *I.A.R.*, 1956-57, p. 17.

182 Our very recent (March 1961) excavations at Chandoli, some 40 miles north of Poona, show that its elements with a dagger or a spear having an antennae and mid-rib had gone for south.

in about 1500-1700 B.C. had also arrived in the Deccan and laid itself upon the earlier Deccan Culture.

However, the indigenous culture survived and seems to have contained the further expansion of this northern influence, and later became the main force in the Deccan. It is in this way that we can explain the differences in pottery fabrics and design between Nevasa and Daimabad[183], which are not more than 15 miles distant from each other, and lie on the Pravara.

With this preface let us see the main features of these cultures. So far, except for Nevasa, none has been described in full; so it is not po·sible to go into details. The information is reviewed under the following heads:

(*i*) Nature of the habititation
(*ii*) Household vessels, furniture
(*iii*) Dress, ornaments
(*iv*) Tools and weapons
(*v*) Disposal of the dead
(*vi*) Economic stage. General.

(*i*) *Nature of Habitation*

Whether it be Malwa, Khandesh, Maharashtra or Mysore-Karnatak, the earliest remains of the habitation are found on a black soil. This today forms the surface (virgin) soil in many parts of the regions mentioned above. It is believed to be the weathering *in situ* of the underlying yellowish silt deposited by the river when it aggraded in Middle Pleistocene times. The weathering was caused by thick vegetation as a result of a damper climatic phase. Thus when the Chalcolithic people entered the river valleys, there must have been thick forests. Clearings over-looking the river, or not far from the river were effected with their stone and copper tools. Though none of these early settlements is fully excavated, it would appear that these elevated black-topped terraces were not very extensive, though fairly large for the times. At a time, each settlement might accommodate 50 to 100 closely-set houses (huts). Each hut would be normally about 10 ft,. by 9 ft. though at Navdatoli we had huts smaller or larger than this. These huts were square, rectangular or round. They were constructed with round, undressed wooden posts, about 3 inches in diameter (at Nevasa, Diamabad). The walls were of mud, whereas the roofs were probably flat or slighty sloping,—and made of interwoven bamboo matting, dry leaves, etc , and covered with a mixture of sand, gravel and clay, or burnt debris (of a pre\ious habitation) and often plastered with lime which was sometimes carried up to the wall.

These houses were largely furnished with large and small storage jars, other vessels of daily and special use, a hearth, and a boat-shaped saddle quern for pounding grains, etc. No intact hearth has yet been reported from the Deccan[184] or Khandesh, but in Malwa and Southern Rajputana these were either like a large hollow cylinder open

183 *I.A.R.*, 1958-59, p. 15.
184 This year (1960-61) a number of small circular or square burnt mud-walled enclosure, supported by stones were found at Nevasa.

at one side, or three-mouthed. The latter might be of a larger house, or a house where two or three things were cooked simultaneously.

(*ii*) *Household Vessels, Furniture*

No other remains of household goods or furniture like cots, wooden stools (if there were any ?) have come to light, probably because these were invariably of wood and have perished. In pottery, dish (*thalis*) are conspicuous by their absence. Of the most common occurrence – in varied sizes, from about 3 in. to 10 in. and more in height—are bowls (*vatis*) and vessels (*lotas* or *tambya*) for storing and pouring liquids, having sharp angular walls and necks and long tubular spouts. The mattred surface of these are paintedin black with most monotonous geometric designs-consisting of hatched triangles, square or rectangles, oblique dashes, etc. But this monotony is relieved at Nevasa by two unique specimens of realistic delineation of a deer and a dog or dog-like animal, for the like of which one has to recall the Upper Palaeolithic cave art of Western Europe. The largest storage jar was about 4 ft. in height and 3 ft. in girth and decorated with finger-tip decoration.

(*iii*) *Dress, Ornaments*

Nor can we form any idea of the dress. But recent evidence from Nevasa and also from Chandoli suggests that spinning of cotton and even (wild) silk was known. Presumably, then, garments of both these materials must have been made.

Among ornaments, by far the commonest are beads of semiprecious stones such as agate, amazonite, amethyst, carnelian, chalcedony, crystal, coral, shell steatite, chalk or faience, terracotta, and less frequently of copper and rarely of gold. All these were certainly strung into necklaces of which an almost complete example, round the neck of a dead child was found at Nevasa in 1960. Silver seems to be completely unknown. Bangles were of the simplest type, and generally of copper, burnt clay and bone or ivory. Rings were worn on figures of the hand.

(*iv*) *Tools and Weapons*

Until this year (1960-61) no intact examples of weapons had been found. It was therefore presumed that among the large number of products of the chalcedony blade industry, those which are called 'points', with or without tang, were probably used as arrowheads. (Fig. 11). Whether there were any of copper is impossible to say in the absence of any evidence. So also the flat copper axes were certainly hafted and used as weapons of offense. (In India, *parasu* has long since been regarded as such a weapon). Round balls of various sizes (3-inch to ½-inch) of stone-quartz and quartzite—might have served as sling stones. These few things—arrows, axe, sling balls—perhaps give a very inadequate idea of the armoury of the Chalcolithic people. The total absence of the sword and the dagger is, perhaps, due to the real non-existence of such advanced weapons, or may be explained by lack of large excavations. At Navdatoli, thus, a fragment of a dagger or a sword with a raised mid-rib was found in 1958-59 from the deposits of Period III[185], whereas at Jorwe, swords are supposed

185 See, *Illustrated London News*, September 5, 1959.

to have been found, but melted away! The latter explanation was further confirmed by the discovery (in 1961) of a 7-inch dagger or spear-head with a faint mid-rib and flat antennae from Chandoli.[186] This is the first stratified occurrence or such a weapon in India.

Chalcedony blades supplied the most common tools like knives, with a single edge (penknife blade) or double edge (parallel sided blade), sickles (lunates and obliquely blunted points, and backed blades), awls or borers (thick elongated points) and scrapers. (Fig. 11).

Heavier tools like those of the carpenter and wood-cutter were made of dolerite and copper and known as polished axe (various types), chisel. adze, copper chisel, poker and axe. The copper axes are all of the flat type, with slightly tapering sides and straight, convex or flaring edges. One type, however, had a shoulder as a fragment from Navdatoli suggests. These are certainly primitive[187] when compared with those from Western Asia which have a socket for hafting (in one piece with the blade). The polished stone axes are also of the pointed but type with biconvex or lenticular section and a slightly convex or straight edge.

In addition to these, there was a thick-sided ringstone, which might have been used as a macehead, but more probably as the weight of a digging stick for ploughing. These are of infrequent occurrence in the Deccan and probably indicate, along with the rarity of boat-shaped querns, that the cultivated grains were not the main source of food. However, some sort of grain (*Jwari*, a kind of millet) was eaten, as suggested by the presence of millet oil used in anointing the child (before—or after ?—its death). The grains were crushed or pounded with plano-convex rubber stones, a number of which have been found, having their flat side pecked for, or made by, rubbing.

Identification of bones of animals recovered from Nevasa and Maski alone are available. Here again we have no very detailed reports regarding the age of the animals, but at Maski[188] the majority of the bones were of young ones. Within these limitations however, it can be said that these included smaller, humpless, short-horned variety of cow or ox (*Bos indicus* Linnaeus or the zebu), the domesticated cattle, sheep and goat, buffalo, beside possibly snails (Bended Pond-snail, *viviparus bengalensis*) and mussels (*Parreyssia sp.*)

At Nevasa, in addition to these animals, deer was also eaten. Thus we may say that beef, mutton, pork[189] and venison, fresh water gastropods and land snails and possibly river fish formed the principal non-vegetarian diet of the poeple. To this, we should add jungle fruits and berries and uncultivated grains, though no remains of the last two have yet been found in any excavation in the Deccan. Hunting and animal grazing thus formed the main economy of life.

186 See pl. and Robert, Heine-Geldern in *Man*, No. 151, Vol. LVI, p. 136, 1956.

187 See, on its effectiveness. Wheeler, Mortimer, *The Indus Civilization*, p. 53.

188 Bhola Nath, "Maski 1954" *A.I.* No. 13, 1957, pp. 123, 125. Apparently there is a contradiction when it is said that Maski remains are of humpless variety, but included on p. 123 under the domestic humped cattle (the Zebu or *Bos indicus* Linnaeus).

189 Sankalia, Deo, Ansari and Ehrhardt, *Nevasa, p.* 531. The statement on p. xv of this work, that pork (pig's flesh) was also eaten is wrong. Pig's bone are also absent from Piklihal. For reference see below footnote 191a.

(*v*) *Disposal of the Dead*

Burial within the house floor or outside was the prevalent custom for disposing of the dead. The children without exception were buried in a wide-mouthed earthen pot (known as urn). If more than one, the urns were placed facing mouth to mouth. Instances of the use of three urns is seen both at Nevasa and Daimabad. At both these sites, the urns were kept horizontally on their sides after digging a shollow pit. But at Brahmagiri they were placed in a vertical position and their mouth covered by the bottom of another urn or vessel.

From close observation of a few excellent remains, it appears that a child's skeleton was either exposed and later the surviving parts were collected and buried, or it was cut up after death and distributed over the two urns, the one on the north having the head and the other on the south containing ribs, legs, etc.

Older children and person over 14, that is adults and adolescents, were buried full length in a large jar; if the latter was found to be short, another pot was used for covering the knees. The exact position varies. In burial 10, the dead body rested on the back, with the head to the left, the knees slightly drawn up and also turned to the left. In burial 19 of an older child (10 years) the position was similar, but the hands were crossed over the breast, and the head was considerably turned towards the right and upwards. Sometimes, as noticed at Nevasa, in 1959-60, the body lying in an extended position was covered by no less than five pots. Naturally, one side was broken for the purpose. In rare cases, the body was placed on the bare ground after thinly plastering it with lime.

The childern as well as the adults were often provided with bowls and spouted pots and beads or necklaces of copper and carnelian. In one instance last year, a copper necklace was found on the neck of a child, strung on silk and cotton threads.[190] From the examination of the necklace it also appears that the child's body was smeared or anointed with cow-dung and a kind of millet oil.

Thus though burial was the principal method, owing to varying needs of the situation, family or settlement, or the customs of the tribes, certain differences existed which fall into five or six groups as follows:

Child Burial

I Vertical (e.g. Brahmagiri)
II Horizontal
(*a*) Single urn
(*b*) Double urn
(*c*) Triple urn

Adult Burial

I Laid extended in
(*a*) Single large urn or jar
(*b*) Double jars

190 In this season's excavation at Chandoli, a part of a small copper bead necklace retains the thread. These might be of silk and cotton.

(*c*) Five jars covering the body
(*d*) Laid on the lime-coated black soil or directly on the black soil

It is worth inquiring how far these burial practices were responsible for moulding the habits of the Megalithic people who succeeded the Chalcolithic in South India, Mysore-Karnatak, Andhra. Their pottery is, of course, basically different, but the use of sarcophagi—huge pottery urns with legs and lids—might have something to do with the urns of the preceding period.

Another important point that needs to be posed, but which cannot be settled is this. So far only the Chalcolithic culture of Mysore and the Deccan (including Khandesh) have given us an idea of the burial practices. We do not yet know how the people of this phase disposed of their dead in Malwa, Rajputana and Saurashtra (though it is now ascertained that at least one group practised burial in the Harappa Civilization). So it is possible that this was a purely Neolithic practice which was adopted by the southward-moving copper-using people.

Who were this people raciall y? The skeletons from Brahmagiri, Bahal, Daimabad, have not yet been studied ; those from Nevasa are insufficient to give a more positive picture.

Out of thirty burials found at Nevasa (1954-56), there were three of persons whose ages have been calculated to be 6, 10 and 20 (or between 17 and 24), the last being that of a woman. In this case alone it is possible to conjecture about the racial type of the person. From the prognathy, broad face with a wide nose (?) and long, narrow head, Professor Ehrhardt is reminded of the characteristics of the primitive people in the jungles of the Deccan.[191] The prognathy is seen in the other two skeletons as well. Thus there is a great possibility that at least a section of the Nevasa population was of a primitive racial type.[191]

(*vi*) *Economic Stage : General*

Whatever it be, economically they seem to have been in a pastoral-cum-hunting-cum-agricultural stage, living in small villages with closely set houses along the river bank. Stone still served them in various ways in all walks of life, copper being rare. This kind of life persisted until it was suddenly changed by a new wave of people, from the north and south, who came with a knowledge of iron, agriculture and town-planning in about the 4th century B.C, though at Nevasa there is a break.

Significance of the New Discoveries

We may now pause for a time and briefly discuss the significance of these new discoveries in the Gangetic Valley, Central India, Rajputana, Saurashtra and the Deccan.

191 In *From History to Prehistory at Nevasa*, p. 520.

191a Confirmation of all or many of this practices and a few additional details about the way of life during the Neolithic period is provided by small trial excavations at Piklihal, Raichur District, by Allchin, F. R., "Piklihal Excavations" *Andhra Pradesh Government Archaeological Series No.* 1, Hyderabad, 1960 (published actually November 1961). A copy of this report the writer got at the galley sta ge owing to the courtesy of the Director, Andhra Pradesh Department of Archaeology.

While the economic stage at which the bearers of these Calcolithic cultures were is fairly well understood, as yet we have no idea who these people were, in the absence of written records from any of these excavations. The skeletal material, though available in some quantity from the Deccan sites, is inadequate for venturing an opinion about the racial types of the people.

It has however been suggested by Professor Haimendorf[192] that the ancestors of some of the primitive or aboriginal tribes—now confined to the fore ts and hills of Madhya Pradesh, Orissa, Bihar and Andhra, tribes likes the Gonds, Baigas of Bastar or the Oraons and Savaras of Chota Nagpur or the Chenchus of Kurnool—might be the authors of the Neolithic Cultures of Andhra-Karnatak. In the same way it might be held that the Bhils and Mundas who are supposed to be some of the Kolarian tribes from the north-west, driven now to their present forest-habitat by the Aryan speaking people, might have been the bearers of the various Chalcolithic Cultures of Rajputana, Central India and the Deccan. In fact our *Puranas* and other literature do speak of Bhillas, Nishadas, Pulindas, (even Andhras) and other tribes as inhabiting these regions. However, these references are admittedly late, much later than the Neolithic Cultures which are about 2000 B.C. The second difficulty is though all these tribes are in varying stages of hunting and food-collecting stage, practising primitive agriculture by burning forest enclaves and ignorant of the real art of ploughing, still none of these have any knowledge of fine pottery, or of chipping, polishing and grinding of stone implements which characterize the Chalcolithic and Neolithic cultures. It is possible, as argued by some anthropologists that this is due to desocializing and de-culturalizing factors. For example, within historic times some of the tribes like the Hunas and Gurjaras, having once been empire-builders, have sunk back to a life of shepherds. This is possible. But the links with the past have to be established. These might be had if excavations in the present secluded habitat of the primitive tribes are carried out and yield traces of cultures which they (their ancestors) had carried with them when pushed back by the oncoming Aryans.

There is also another way or possibility of identifying the bearers of the Chalcolithic Cultures. It has already been argued from the juxtaposition of Mahabharata sites and Grey Ware sites in the Ganga-Yamuna Doab, by Shri Lal[193] that the Grey Ware people might be a group of Aryans or the Mahabharata people, whereas the probability of the Malwa or Maheshwar-Navdatoli people, as Haihayas or mixed Aryan tribe from Iran, has also been pointed out by the writer.[194] Likewise, the various pottery cultures in Southern Rajputana and Saurashtra might be attributed to the various Yadava tribes. In the same way we may account for the Deccan Chalcolithic as the result of the southward migration of one of the Aryan tribes.'[195]

192 Presidential Address. *Proceedings*, 37*th Indian Science Congress*, Part II, p. 176.

193 *A.I.* Nos. 10-11, p. 151.

194 In *Illustrated London News*, September 5, 1959 and *Sardha Satabdi special volume* published by the Asiatic Society of Bombay (New Series), 1959, pp. 229-39.

195 Cf. also, Allchin (*op. cit.*, p. 140-141), who on very slender evidence attributes the birth of the Deccan Neolithic culture to a Dravidoid or Indo-European stock from Iran and Central Asia, thus ruling out its indigenous origin.

With some plausibility, then, we may attribute the Chalcolithic Cultures of the Chambal, Narmada, Tapi-Godavari Valleys to some of the Aryan tribes. All these are tied by common features and differ from valley to valley according to the pottery fabrics and types. But their basic way of life remains the same.

This theory would remain unconfirmed unless and until some writing is found in their excavated habitations which identifies at least some of them with one or two of the Puranic or Vedic tribes. But this may never be found, as they were illiterate—and Aryans are believed to have been illiterate—in spite of the high philosophical and spiritual content of the Rigvedic *mantras*, in spite of the metaphysical speculations of the Upanishads, and in spite of the earliest etymological efforts of Yaska and the first systematic grammar of Sanskrit by Panini.

Thus, the actors on the Chalcolithic stage remain hazy, almost unknown. It is towards their identity that all our efforts should now be directed.

This uncertainty about the identity of the Chalcolithic people does not enable us to accept wholly the view that the impetus to march forward from the Stone Age—from the stage of a savage and barbarian—came from Western Asia, particularly the grassy hill country of "the Fertile Crescent" (of Braidwood and Breasted) which is regarded as the cradle cf civilization.[196] Professor Braidwood himself has recently made a significant statement while "seeking the world's first farmers in Persian Kurdistan."[197] He says, "It continues to appear that the more important generative factors in the appearance of effective plant and animal domestication are not to be sought in the facile explanations of environmental determinism." Striking also are the words, "Since this zone (of grassy and open oakland) runs from Shiraz in Iran through highland Iraq and the southern flanks of Turkey to southern Syria—a distance of some 1,200 miles—we do not suppose that either our previous Iraq sites (e.g., Karim Shahir, Jarmo) or our sites near Kermansha are in any way unique instances either in time or place wherein food production began. Our sites simply happen to be those which the accident of archaeological discovery has allowed us to examine so far."

Thus, on the one hand, the view about one or two regions alone being the birth place of civilization is being revised. On the other, if it is proved by further work that some of the primitive or aboriginal tribes are to be credited with the Mesolithic and even the Chalcolithic cultures as even Sir Mortimer Wheeler seems to think, then naturally, it would imply that these are indigenous or autochthon and not inspired by outside influences. Then the relation of this fact to the geographic factors will have to be re-examined. Otherwise, on the current theory, it is held that the bearers of a superior culture came along the principal lines of communication and gradually occupied the most fertile river valleys, ousting the hunters and food-gathereas to Central Indian forests and hills. It is in this way that we can explain the unequal develop-

196 Braidwood, Robert J., and Howe, Bruce, *Prehistoric Investigations in Iruqui Kurdistan*, Chicago, 1960, p. 11.

197 *Illustrated London News*, October 22, 1960, pp. 695-97. Sir Mortimer Wheeler (*Early India and Pakistan*, p. 141) attributes the origin of the Chalcolithic cultures to the microlithic cultures. This seems to be wrong, as it does not take into consideration the differences between the microliths and the stone blade industries of the later period.

ment of Indian civilization : for some areas, because of their natural resources and nearness to the highways, attracted settlers ; some, like Northern Gujarat, because of semiaridity were settled late, and others, like Assam, Kerala and Central Indian forests, became refugee areas—areas of isolation—where the aboriginal tribes continued to live on in a hunting stage until today.[198]

198 See Subbarao, B., *The Personality of India*, pp. 20-27 and Fig. 6, 2nd Edition, Baroda 1958.

PLATE 1



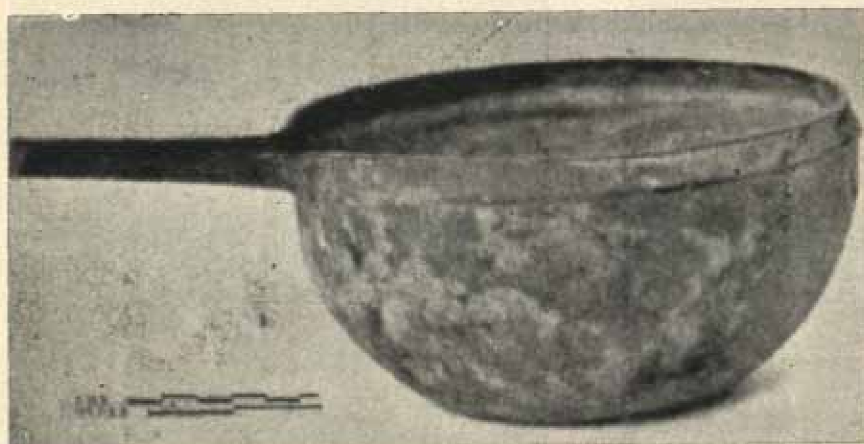


(a)

(b)

PLATE 2





(a)

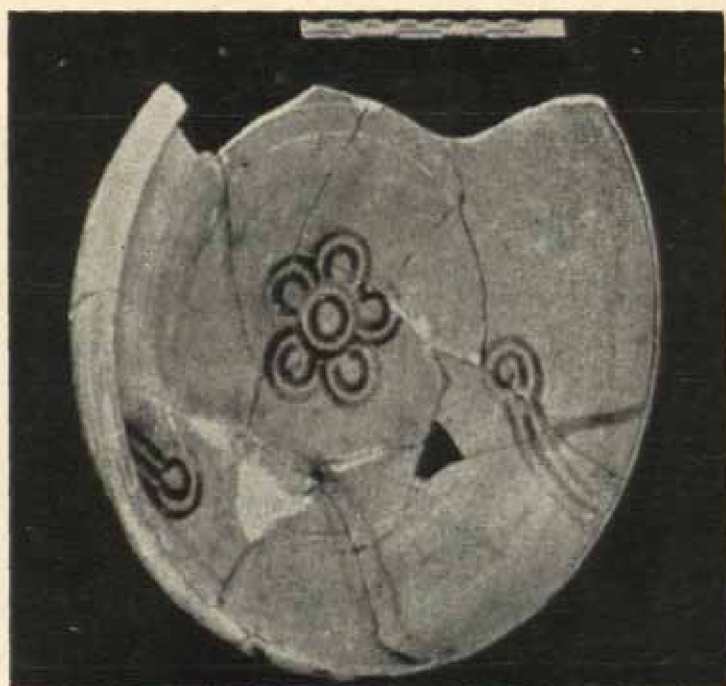
(c)



(b)



PLATE 4



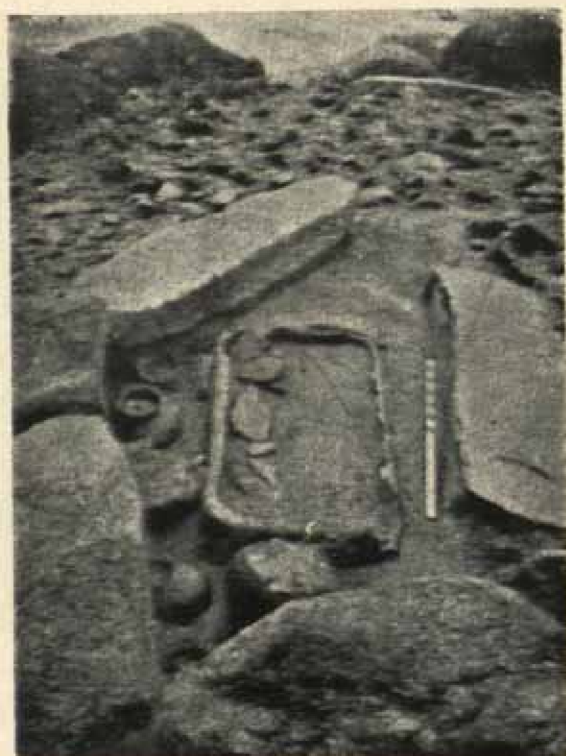
(a)



(b)



(a)



(b)

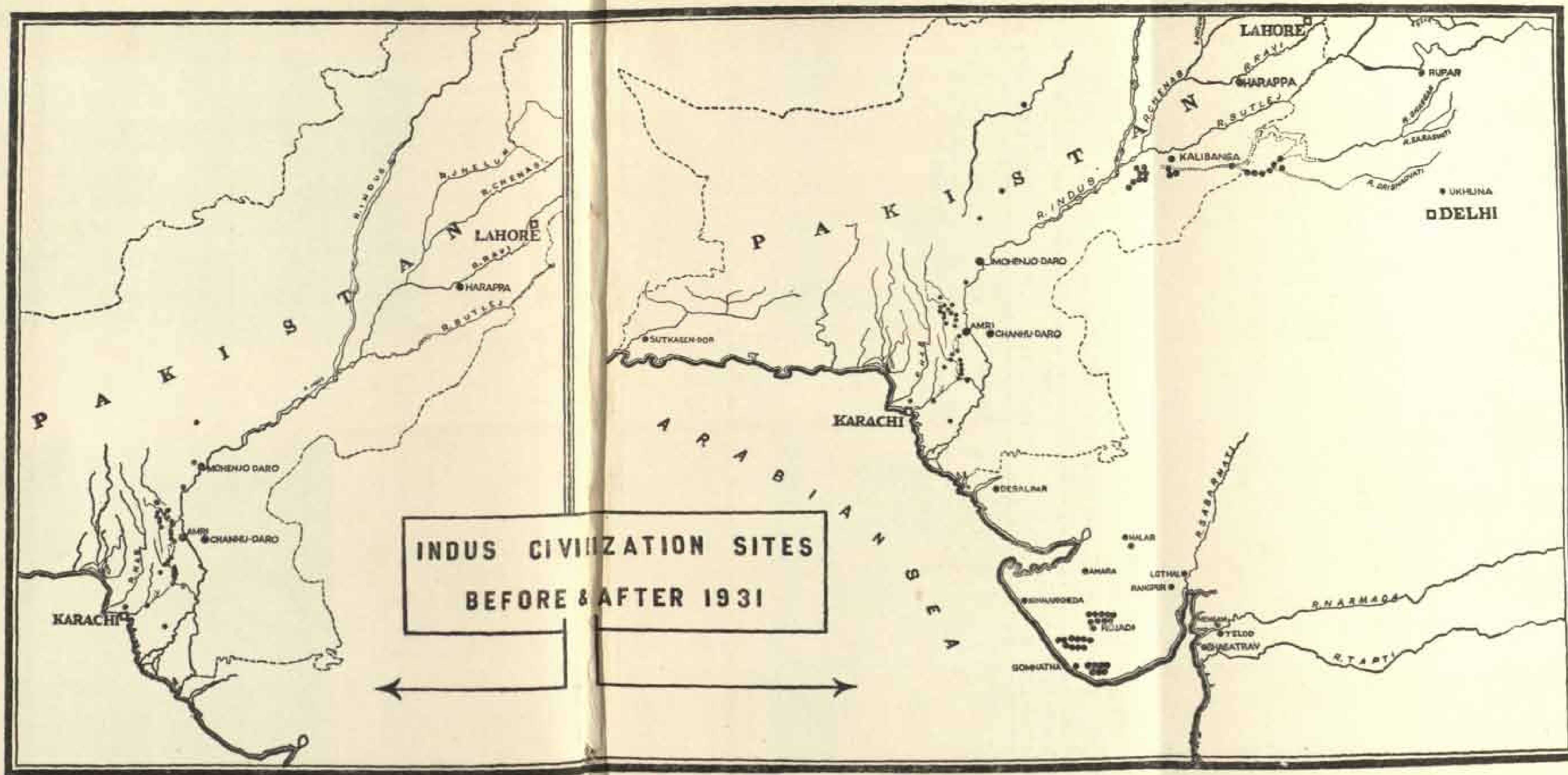

INDUS CIVILIZATION SITES
BEFORE & AFTER 1931
PAKISTAN
LAHORE
R. JHELUM
R. CHENAB
R. RAVI
HARAPPA
R. SUTLEJ
R. INDUS
MOHENJO DARO
AMRI
CHANHU-DARO
KARACHI
RUPAR
KALIBANGA
DELHI
SUTKAGEN-DOR
ARABIAN SEA
DESALPAR
HALAR
LOTHAL
RANGPUR
SOMNATHA
R. SABARMATI
R. NARMADA
R. TAPTI

Fig. 1.

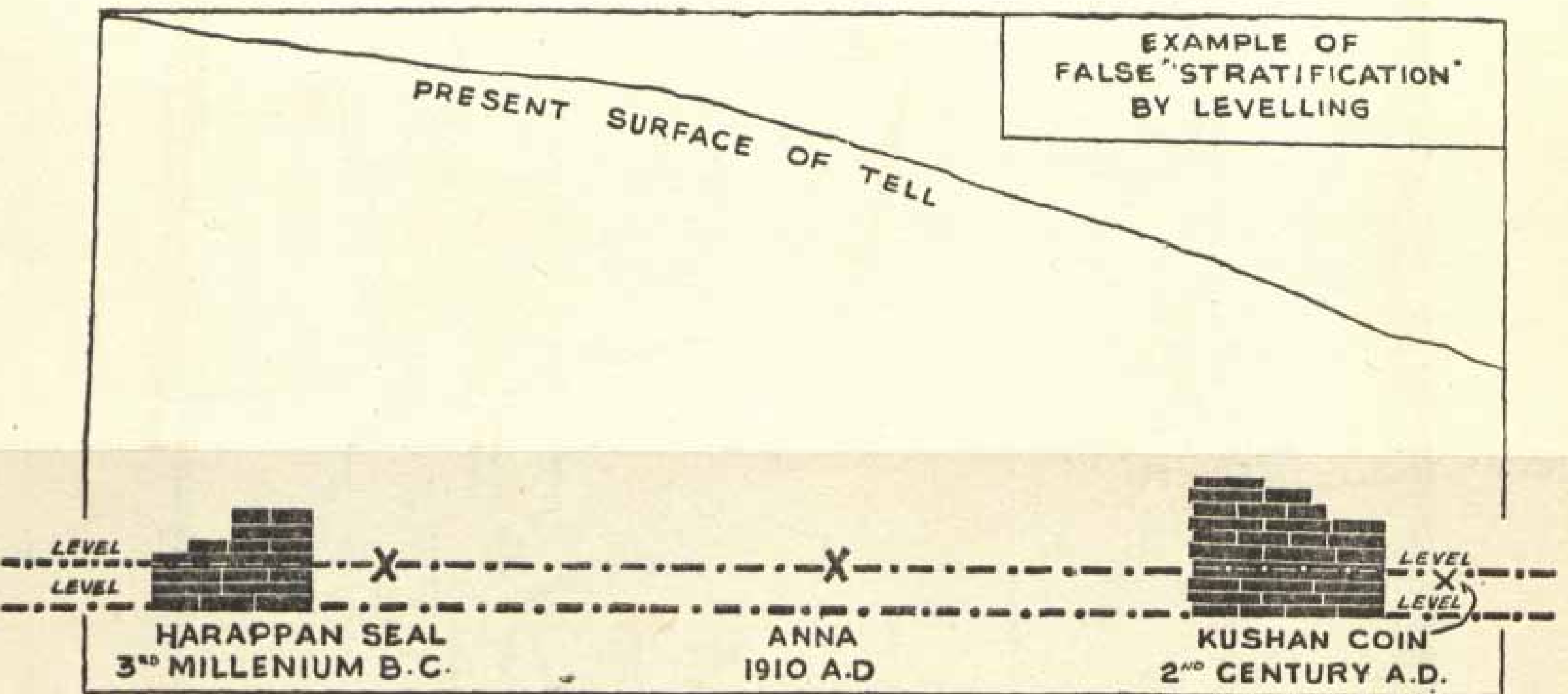

EXAMPLE OF
FALSE "STRATIFICATION"
BY LEVELLING
PRESENT SURFACE OF TELL
LEVEL
LEVEL
LEVEL
LEVEL
X
X
X
HARAPPAN SEAL
3RD MILLENIUM B.C.
ANNA
1910 A.D
KUSHAN COIN
2ND CENTURY A.D.

Fig. 2 (a)

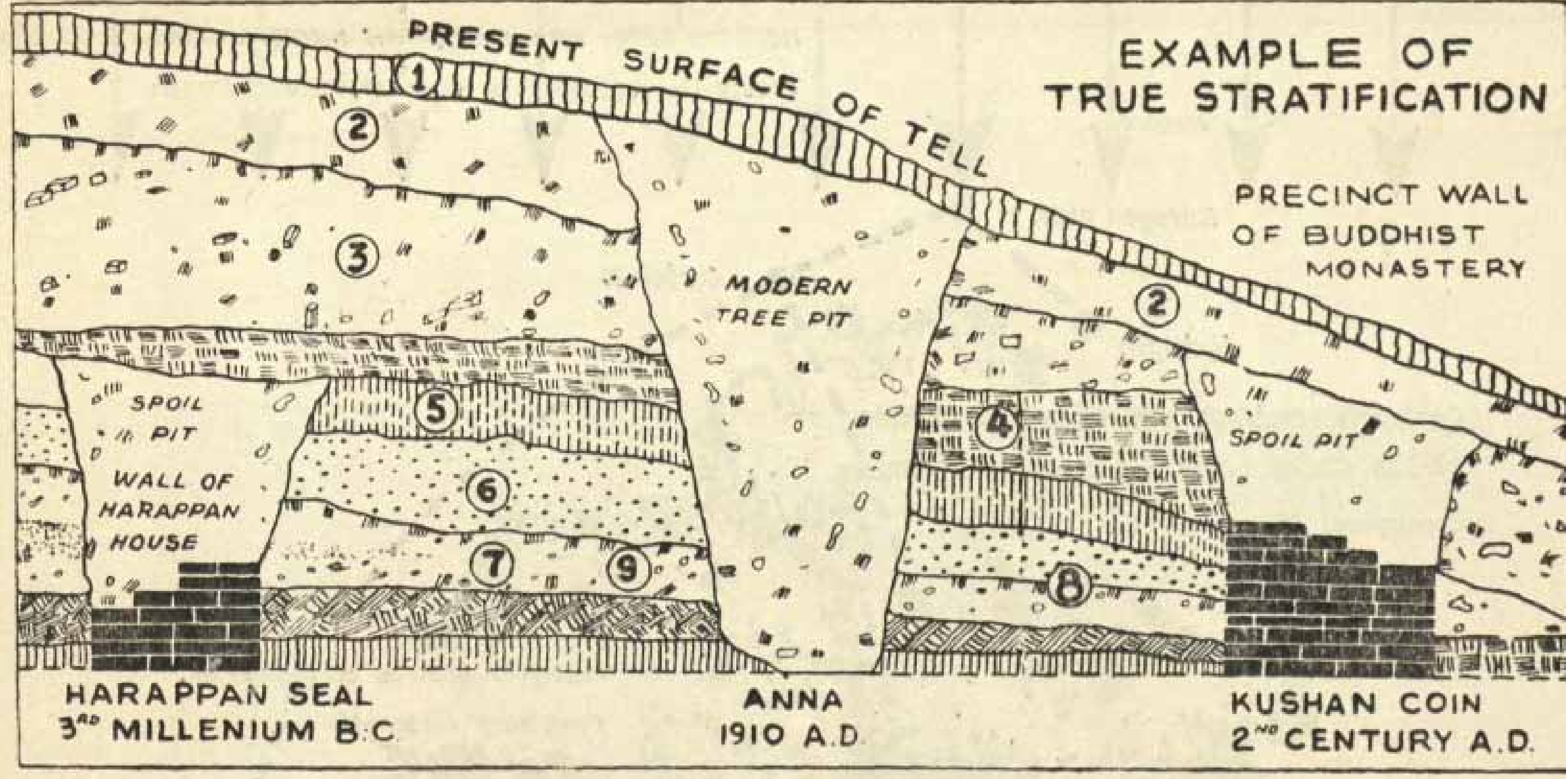

EXAMPLE OF
TRUE STRATIFICATION
PRESENT SURFACE OF TELL
PRECINCT WALL
OF BUDDHIST
MONASTERY
MODERN
TREE PIT
SPOIL
PIT
WALL OF
HARAPPAN
HOUSE
SPOIL PIT
1
2
3
2
5
4
6
7
9
8
HARAPPAN SEAL
3RD MILLENIUM B.C
ANNA
1910 A.D
KUSHAN COIN
2ND CENTURY A.D.

Fig 2 (b)



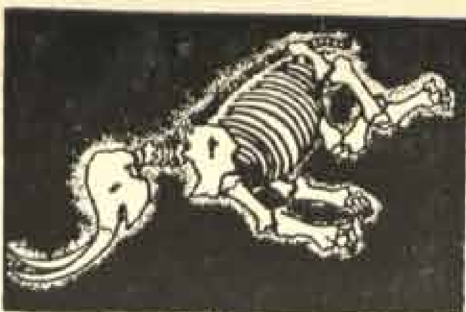




Fig 3 Three—fourths dissipates in two half lives, and so on. Radioactivity at any point, compared to radioactivity of modern carbon, tells the amount of time elapsed since death.

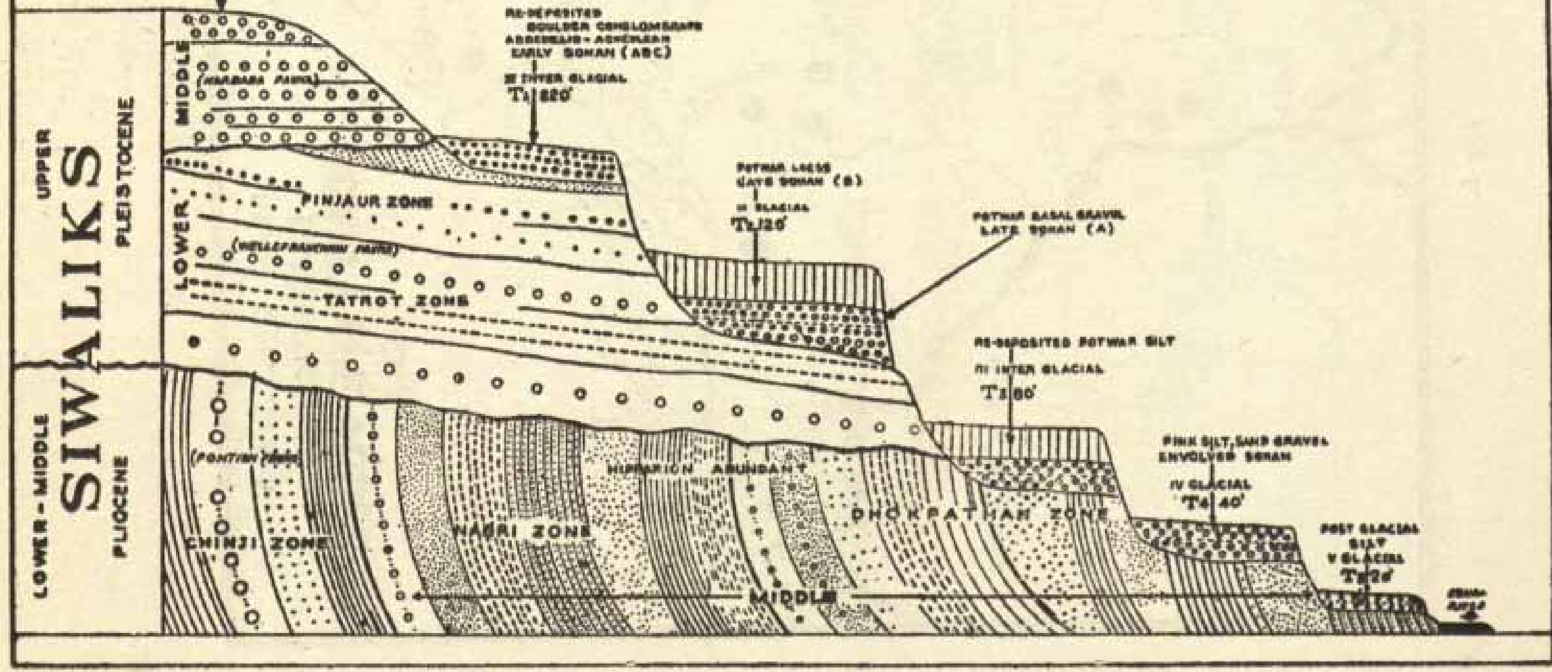

COMPOSITE TRANSVERSE SECTION THROUGH THE SOHAN VALLEY, SHOWING STONE AGE SEQUENCE IN RELATION TO ITS PLEISTOCENE TERRACES UNDERLYING LATE CAINOZOIC SIWALIK STRATA (AFTER DE TERRA AND PATERSON)
SIWALIKS
LOWER - MIDDLE
PLIOCENE
UPPER
PLEISTOCENE
MIDDLE
LOWER
PINJAUR ZONE
TATROT ZONE
CHINJI ZONE
NAGRI ZONE
DHOKPATHAN ZONE
HIPPARION ABUNDANT
MIDDLE
BOULDER - CONGLOMERATE
PRE-SOHAN
II GLACIAL
T1 400'
RE-DEPOSITED BOULDER CONGLOMERATE
EARLY SOHAN (ABC)
II INTER GLACIAL
T2 220'
POTWAR LOESS
LATE SOHAN (B)
III GLACIAL
T3 120'
POTWAR BASAL GRAVEL
LATE SOHAN (A)
RE-DEPOSITED POTWAR SILT
III INTER GLACIAL
T3 80'
PINK SILT, SAND GRAVEL
EVOLVED SOHAN
IV GLACIAL
T4 40'
POST GLACIAL
SILT
V GLACIAL

Fig. 4

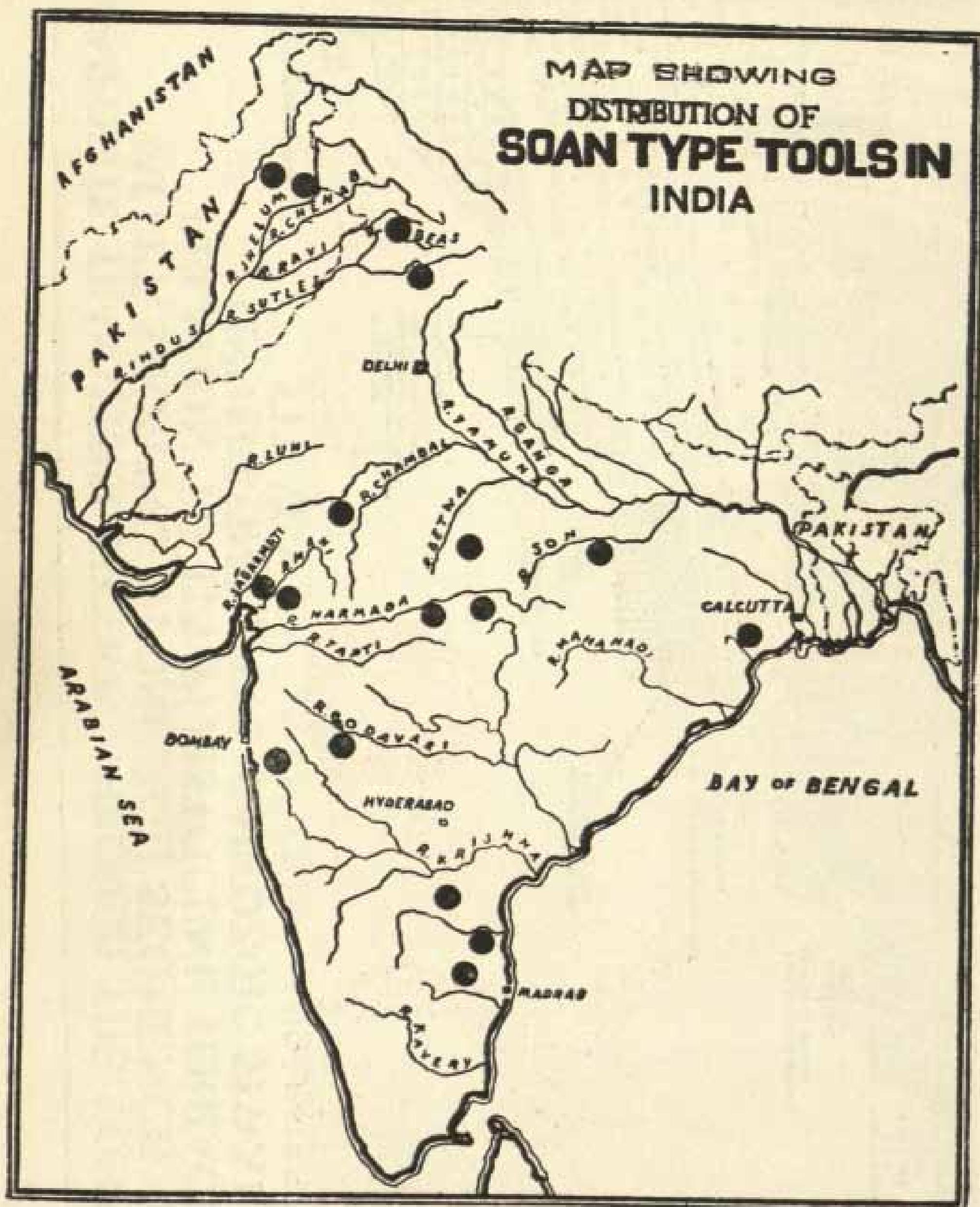

MAP SHOWING
DISTRIBUTION OF
SOAN TYPE TOOLS IN
INDIA
AFGHANISTAN
PAKISTAN
R. INDUS
R. JHELUM
R. CHENAB
R. RAVI
R. BEAS
R. SUTLEJ
DELHI
R. LUNI
R. CHAMBAL
R. YAMUNA
R. GANGA
R. BETWA
R. SON
PAKISTAN
R. SABARMATI
R. MAHI
R. NARMADA
R. TAPTI
R. MAHANADI
CALCUTTA
ARABIAN SEA
BOMBAY
R. GODAVARI
HYDERABAD
BAY OF BENGAL
R. KRISHNA
MADRAS
R. KAVERY

Fig. 5.

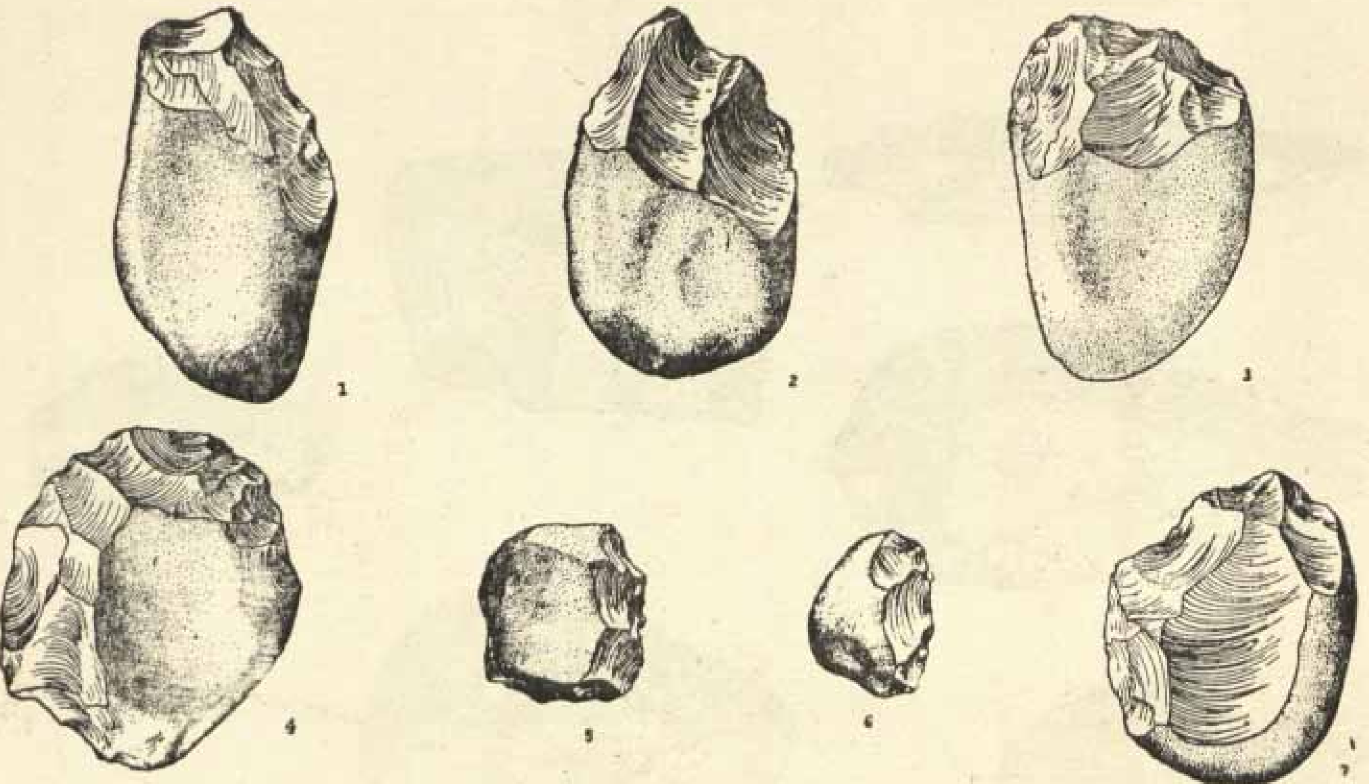


Fig. 6.













Fig. 7

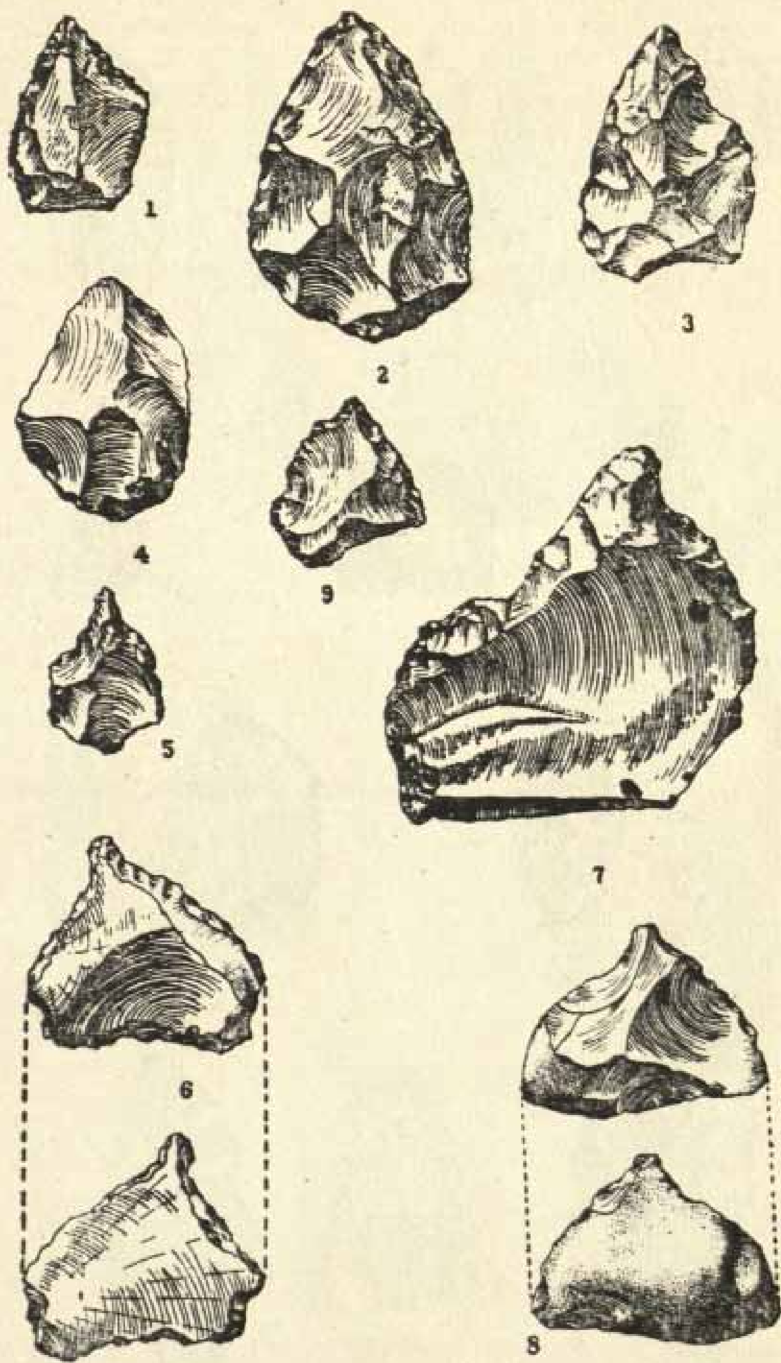


Fig. 8.


1

2

3

4

5

6

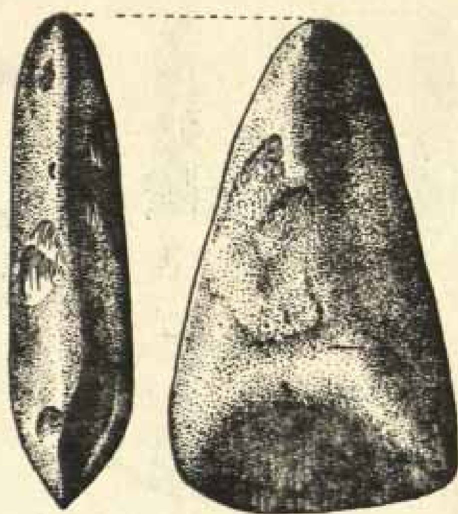
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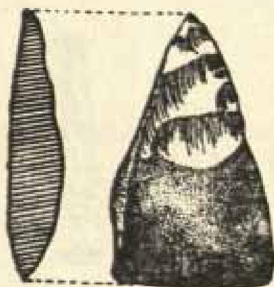
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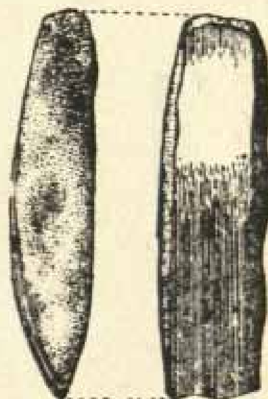
Fig. 9.



1



2



3



4

Fig. 10.

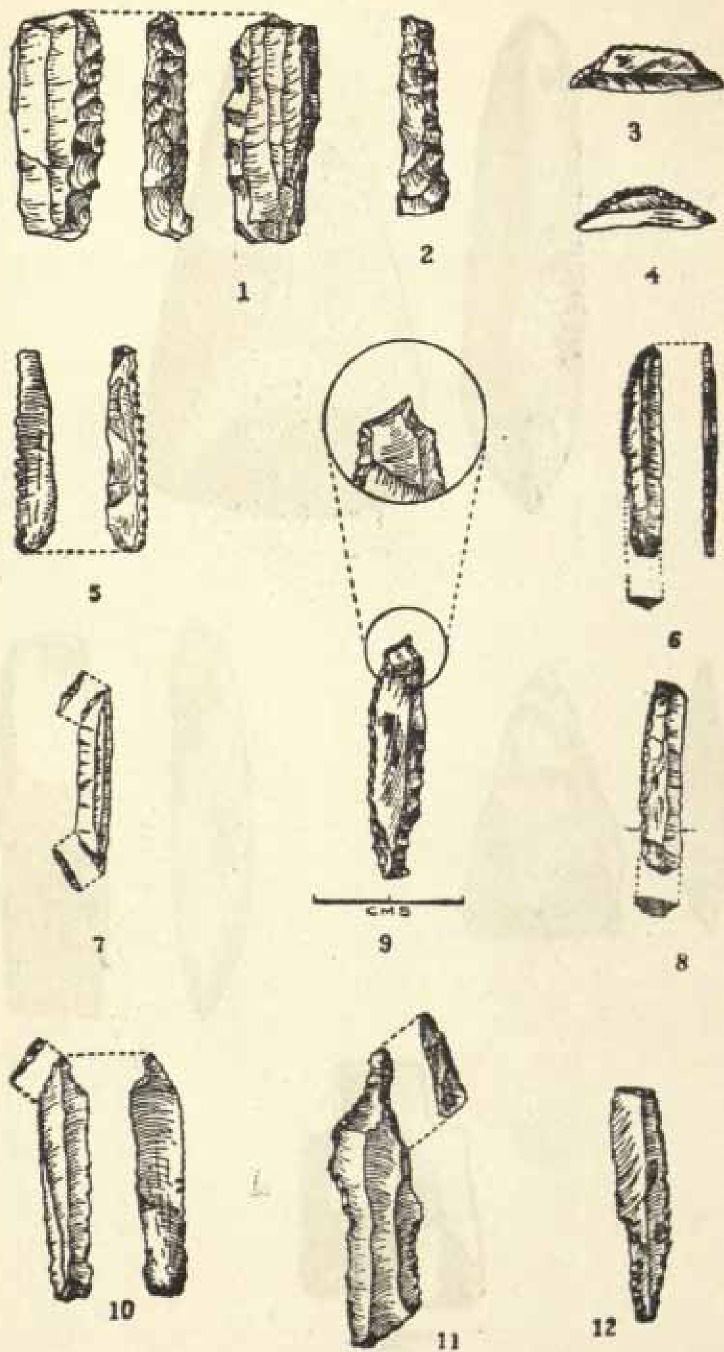


Fig. 11

PART II

Prehistoric Archaeology

With regard to the work since 1961, it was originally intended not to give many details about the recent work in prehistory and protohistory, as three of my works published during the last four years had dealt with them; still, as the new information came, it became necessary to appraise it. While doing so, it became apparent that instead of relating it regionwise, it would be advisable to arrange it or group it according to the developmental stages in which our studies in India are, so that the value or importance of each contribution can be properly appreciated. This would also help in the future planning of this subject.

Accordingly, in prehistory three groups may be made in the following manner:

(i) Excavation, followed by a study of the material by the latest scientific methods.
(ii) Collection, followed by systematic classification, description and illustration; and
(iii) Simple collections.

A PALAEOLITHIC

Chirki-Nevasa

This is a fine instance of sustained, scientific investigation, after the initial chance discoveries at Nevasa, District Ahmadnagar, Maharashtra, in 1954. Though these discoveries were fully reported in our report on the excavations at Nevasa, yet I was anxious to put the occurrence of the handaxe industry on a much secure founda-

tion. Since I was engaged on other work I was looking out for a student with a geological background. So when Dr. Gudrun Corvinus came from Germany, I entrusted her with the survey of the entire Pravara Valley.

Though a foreigner, she carefully studied the valley and came upon the Chirki Nala, a few miles downstream of Nevasa. Here near a small rock outcrop, a few handaxes were seen, covered by a talus deposit. A proper excavation was recommended. This Corvinus carried out with typical German thoroughness. The work lasted for several seasons, and thousands of tools—mostly of the Early Stone Age—were found. After she had left, the work was carried on by Dr. Z.D. Ansari, Dr. M.L.K. Murty and Dr. R.S. Pappu.

The main reason for continuing the excavation of a small site was to get cent-percent evidence for establishing it as a camp site of Early Man. For, though Dr. Corvinus had claimed in three of her articles that Chirki was the "First" camp site of Early Man to be discovered in India, yet full proof was lacking.

Dr. Ansari and Dr. Pappu, after their excavation, came to the following conclusion: 'Taking all this available data into consideration, it can be inferred that the site under study is definitely different in its nature of occurrence as compared to other stone-age sites so far reported in India. The cultural material of Acheulian tradition at this site occurs in a deposit which is not directly connected with the river activity. The evidence such as mint condition of tools and the asssociated rubble and their very little displacement from original position and also the presence of debitage in relatively large number at some of the excavated trenches clearly indicate that the region Chirki-Nevasa had served both as a camping and a factory site for the Acheulian Man. Unfortunately, the debitage which one would expect from such a factory site has been washed away, as the site is situated on a rocky surface close to the main river channel. The presence of a few fossil bones in the excavated portion is also indicative of human activity. Even though the human activity was spread over a large area on the right bank of the Pravara, the main focus appears to be in the vicinity of the present cutting. Tr. VII. The area is characterized by the presence of high rock platforms and overhanging rocks. The former might have served as seats. The desired raw material from the rubble was carried to these spots and tools were fashioned. The overhanging rocks might have provided necessary shelter from wind, rain, etc., for the Acheulian Man. The importance of the Chirki-Nevasa is thus several-fold. The site was most ideal for habitation because of the prevailing advantages of the environment, marked by the availability of raw material, the close proximity of the perennial water supply, suitable physiographic setting and a game for hunting."

Here the matter rests, as far as the camp site is concerned. Meanwhile, Dr. Corvinus undertook a detailed study of the tools discovered by her. When she had to return to Germany, a select number of tools were sent there. These have been returned. And now Dr. Joshi and Dr. Marathe have undertaken the metrical analysis of Chirki-

1 Corvinus-Karve, The Acheulian Workshop at Chirki ......, "*Indian Antiquary*, Vol 4, 1970, *pp*. 13-22 22.

Nevasa tools. Stratigraphically the Acheulian horizon and the industry have been placed in the Late Middle Pleistocene by Ansari, Murty and Pappu.[2]

Bhimbetka

Since the discovery of the group of rock shelters and caves, called Bhimbetka, about 45 km. south of Bhopal, two rock shelters caves have been systematically dug by Dr. V.S. Wakankar, Vikram University, and Dr. V.N. Misra of the Poona University.[3] These excavations have yielded a rich material, which when divided stratigraphically and typologically, give the following chronology:

(i) Lower Palaeolithic,
(ii) Middle Palaeolitic,
(iii) Upper Palaeolithic, and
(iv) Mesolithic

While Wakankar's collections are being studied, Misra has published the result of his three seasons (1972-1975) excavations. Since Misra had experience of excavation of French sites under Prof. Bordes as well as Prof. Lumley, he dug in the cave or rock shelters III F 23 and F 13 most systematically, noting the position of each tool or flake, as it came on or as it was recorded from a sieve, and presented his data. Thus not only there are two good sections of the excavated area, but the square and depthwise distribution of the artefacts, as given in Table I, and their toolwise classification as in Table II, can be made, Thus no less than 4,705 tools have been carefully classified. Three other Tables give the type and depthwise distribution of flakes and cores, handaxes and cleavers, and non-biface tools.

Misra then offers his typological observations as well as some very interesting general conclusions. He says that the man who occupied this cave during the Early Stone Age selected very good purple or grey quartzite for handaxes and cleavers, whereas ordinary, easily available yellowish quartzite was used for flakes, etc. Of the total numbers of 4705 artefacts, only 1,501 pieces (31.90 per cent) are tools. After a detailed consideration of the percentage of various types, he tells us that—

(i) the industry is mainly Acheulian, and this is characterized by a very low percentage of bifaces,
(ii) high proportion of cleavers to handaxe, characterized by high standard of workmanship,
(iii) predominance and diversity of non-biface tools,
(iv) high percentage of end-scrapers and Levallois flakes, and
(v) complete absence of chopping tools.

2 *BDCRI.*, Vol. *XXXV*, 1976-77, p. 13, and earlier references therein.

3 Misra, V.N., The Archeuline Industry......at Bhimbetka... ..." *Puratattva*, No. 8, 1975-76, *pp.* 13-36.

Thus, on the whole, the Acheulian industry foreshadows the arrival of the Mousterian tradition, and represents the terminal phase of the Acheulian.

Misra corroborates this conclusion by reviewing eight well stratified and described collections, emphasizing at the same time that this is the first time that a closed site has yielded so many artefacts *in situ*, and which was dug after the latest scientific methods.

The ecological background of Bhimbetka shows that the reason why man persisted in being here from Early Palaeolithic Times until today, was that the region is ideally suitable for this kind of life of hunting and foraging, though the former no longer forms as a regular means of subsistence.

There is no doubt that more work on these lines in this region will give us a real insight into the life of Stone Age Man at various periods.

This vast collection is being analysed by Mrs. Barz of Australia on the basis of what she calls "Economic Prehistory". This is the further extension of the results of the analytical studies.

Durkadi Nala

Though the Narmada was one of the first rivers in Central India to attract the attention of prehistorians all over the world because of the alleged discovery of a human skull at Bhutara with only the subsequent brief notes prepared by de Terra and Paterson at our disposal, much remained to be done. This I realized when I spent more than four seasons at Maheshwar and also examined the river sections, from Amarkantak downwards.

The Narmada is the one river which abounds in huge pebbles, pebble halves, as well as finished tools—handaxes, cleavers, scrapers, etc. Thus there is a great probability of finding a true evolutionary series of industries. But this must rest not on haphazard surface collection, but sound stratigraphical evidence. Hence Supekar[4] was advised to dig at Mahadeo Piparia. This was vertical excavation. It emphasized the need of a horizontal excavation in one stratum at a time. Hence, Jorge Armand, an associate professor from Venezuela came and was advised to dig a site near Maheshwar. After a preliminary survey he dug in the Durkadi Nala. He dug no less than 11 trenches; each trench was 1.5×1.5 m. in size. These were along a single axis of 3.5 kilometres in length, parallel to the Durkadi brook. All trenches were excavated up to the basal rock. The entire areas of the trenches were sieved in standard levels of 10 centimetres. and the geological and cultural particulars of each level recorded, along with the position of each pebble tool.

The entire work was so neat, clean and careful, as can be seen from the colour photograph. Of course, it does not solve the problem of the pebble tools. For, at present, we have no means to say that the boulder/pebble terrace in which Armand dug is the earliest even in the Narmada Valley; but it seems that by further excavations in this very area, preferably, some metres above the present site, Armand might have succeeded in establishing an evolutionary sequence.

4 Extracted from the Ms., "*The Middle Pleistocene Pebble Tool Site of Durkadi in Central India*, by Jorge Armand.

Saurashtra

Palaeolithically Saurashtra was unknown, because as Robert Bruce Foote observed, the necessary raw material was not there, nor was it forested. Both these observations have been proved to be quite wrong by the discovery of palaeoliths at Rojadi, and then subsequent methodical explorations, followed by scientific survey of the entire Bhadar Valley by Lele, and that of the Hiran by Marathe. Now Subrata Chakrabarti has systematically explored the south-east coast of Saurashtra, particularly the Kalubhar Valley in Bhavnagar District.[5]

He has further adopted a little modified classification of Kleindienst. Thus functional terms such as 'cutting edge', etc., have been avoided and more non-committal terms like 'long sharp edges' have been introduced, though within the broad group of shaped-tools, the old names like handaxe, with its sub-types, have been retained. Further, all these have been measured and their sizes and weights discussed and illustrated, according to the current practice. Thus we have an uptodate piece of work.

Hunsgi

Hunsgi, in the Shorapur Doab, District Gulbarga, Karnatak, is another example of how a site, though superfically small and insignificant, can in the hands of a scholar who is acquainted with the latest scientific methods of exploration, including excavation, and studying the material and looking at the problem from several view-points, can become a site of great importance to scholars of prehistory in India and abroad.

The Hunsgi Valley is an amphitheatre-like basin and forms part of a larger area, called the Shorapur Doab. In the initial stages the valley did not give any evidence of the Lower Palaeolithic phase. Nor was it found promising by Robert Bruce Foote, who exploring it in 1876 had found tools of limestone. These he regarded as stray pieces lacking cultural context.

Nearly a century after when Dr. Paddayya of the Deccan College re-visited the valley, he collected no less than 50 handaxes and cleavers. Like an expert detective, he decided to find their source, and learn as much as possible about their makers—the Early Man of Hunsgi.

After a continuous search for more than five years involving trial excavations and full-fledged exposures, Paddayya has proved that the Hunsgi Valley was the camping place of Early Man, and that the spot where granite boulders are seen today must have provided something like a wind screen—a covered shelter—for sitting and manufacturing tools from limestone pebbles and cobbles, many of which had been imported from some distance.

All this has been convincingly shown only by carefully plotting no less than 196 artefacts, and minutely studying the marks of the having been used, left on the pebbles and cobbles as well as the boulders which might have been used as anvils.

5 *The Prehistory of Bhavnagar District, Gujarat State*, Ph.D. thesis, Deccan College, 1977.

Not content with this meticulous study, Paddayya has sought to keep the scholars in India and abroad informed of the progress of this small but important project. He has further collected all environmental and ethnographical information for reconstructing the life of Early Man. One of his observations is worth noting, e.g., that the absence of animal remains—bones—might perhaps be accounted for by the fact that contrary to the earlier view, it is now increasingly being realized that the Early Man, probably depended upon the collection of seasonal roots and fruits rather than the regular killing of animals. And this was particularly so in countries like India and Africa.

An important aspect of the tools from Hunsgi is that a majority of them consist of handaxes and cleavers. All these are made on limestone. This is comparatively a softer stone than the normal quartzite or basalt, or diorite or granite. This variability should be significant. Because while one can freely use the tools—artefacts—of the latter three material for digging in the ground, or cutting wood, or dismembering animal skeletons, one cannot do so with the softer limestone tools. If so, we might infer that tools like the handaxe and cleaver were not used for hard work like digging and chopping wood, but mainly for cutting and piercing. Anyway, this point might be established by actual experiments. Meanwhile, only one illustration from Dr. Paddayya's latest articles is reproduced to enable readers (students) to know how the distribution of artefats, etc., is plotted.[6]

In his latest article, Paddayya has well summarized the aims and methods we need to adopt in India. Says he,[7] 'We are no longer justified in believing that Indian Palaeolithic archaeology merely consists of the discovery of river sections and the building up of stratigraphical-cultural sequences based upon them. Little can be accomplished by way of hopping from one region to another; rather there appears to be a clear need for selecting smaller areas and working these up systematically in a sustained manner. The principal object of such studies ought to be investigation of primary sites, which alone can help us in resuscitating Stone Age Man's behavioural patterns. Obviously there is immense scope for inter-disciplinary work in these investigations, but it is well to realize that interdisciplinarity is not an end in itself—a sort of beautifying mechanism, but only a means towards the realization of culture-historical goals. As a matter of fact, it is this confusion of the means with the ends which has prevented the layman and the fellow-archaeologist alike in India from regarding Palaeolithic archaeology as a serious and worthwhile academic discipline.'

He has further indicated the techniques one has to follow in these excavations. One can only hope and pray that collectors and foragers in India will listen to this advice !

METRICAL ANALYSIS

Prof. R.V. Joshi and Dr. A.R. Marathe[8] have taken one step further in putting the Indian palaeolithic studies on modern uptodate lines.

6 Paddayya, K., "The Achenlion Culture of the Hunsgi Valley, (Shorapur Doab),Peninsular India", *Proceedings of the American Philosophical Society*, Vol. 121, 1977, *pp*. 383-466.

7 Paddayya, K., New research designs and field techniques in the Polaeolithic archaeology of Iadia", *World Archaeology*, Vol. 10, 1978, *p*. 106.

8 *Puratattva*, No. 8 (1975-76), *pp*. 3-12.

They have presented the metrical analysis of handaxes from Chirki on Nevasa where Dr. Corvinus had found a rich Acheulian workshop. Their paper deals with 88 handaxes. Fortunately, they got the help of a computer from the Tata Institute of Fundamental Research, Bombay, for processing their data.

The entire paper should be studied carefully and used by all students of Indian prehistory. Here the main conclusion of this study is given. Joshi and Marathe conclude, "The collection under study gives generally high value, or T/B (thickness/breath), thus suggesting unrefined forms, which is true in this case as the industry shows Early to Middle Acheulian characters. Their rates are more or less constant, as the entire collection is from the same cultural stage. If the tools had been hafted as lance points, the thickness should be much less and the index T/B would give low values. The tools under consideration are fairly thick and do not seem to have been used in this way." However, this final conclusion should be tested by actual experiments.

Meanwhile, Dr. Joshi and Dr. Marathe have attempted a correlation analysis of handaxes and cleavers and given a functional interpretation based on this study.[9]

Rajasthan

Though not immediately useful from the archaeological point of view, the work of scientists of the Luni Development Block gives us an insight into the past climate of Rajasthan.[10]

Archaeological-cum-geomorphological investigations were carried out in Jodhpur District by a joint team of the Poona University and Physical Research Laboratory, Ahmedabad.[11]

Later a team of the University of Poona and Deccan College carried out preliminary investigation around Jodhpur and Budha Pushkar.[12]

The evidence of the existence of the Upper Palaeolithic in Punjab has come none too soon. For it should be possible to tie this up with these traces recently discovered at Budha Pushkar, Hokra, and other sites in Rajasthan and from Rohri Hills in Sind by Drs. Bridget Allchin, Andrew Goudie and Karunakara Hegde. Though the collections made so far, particularly of the burins, are not large, their context, and the difference in size definitely place them in a separate group.

While the discovery of several Middle Palaeolithic, as well as of the Early Palaeolithic sites both in Central Rajasthan as well as in parts of the Sind desert prove that the cultural developments in India cannot be divorced from those of Western Asia.[13]

9 *BDCRI* Vol. *XXXVII* (1977-78), *pp*. 48-60

10 Singh, Surendra *et al.*, "Geomorphic Changes......Rajesthan Desert," *Man and Environment*, Vol. II 1978 *pp*. 1-13.

11 Agrawal, D.P., *Exploration in Jodhpur District Ibid*, *pp*. 74-75.

12 Misra, V.N., *Ibid*.

13 Allchin *et al*, *The Prehistory and Palaeogeography of the Great Indian Desert*, *pp*. 123-130 (*Figs* 4.8-9); 149; 278 (*Fig*. 8.5).

Sagileru

Dr. Thimma Reddy's and Sudarsen's further investigations in the Saligeru Basin in Cuddapah District has confirmed the results of Reddy's previous work, viz., the finding of a good percentage of pebble tools along with handaxes, etc., in the Early Stone Age, and also the occurrence of burins of several types in the Upper Palaeolithic as well as the succeeding Mesolithic. Thus, neither Reddy's nor Murty's earlier discovery of a large number of burins of a classical type in the adjoining district of Chittoor can be regarded as an isolated phenomenon.[14]

Paisra

A rich Acheulian-cum-Middle Palaeolithic Site was discovered at Paisra, District Monghyr, Bihar.[15] As pointed out by me, while commenting on a similar discovery at Bhimban some 25 years ago, Bihar is a land of great contrasts : While its northern part is formed by alluvial deposits, the southern or south—western one is rocky. Thus, the area around Paisra is rocky, and forms a part of the Kharagpur hills. Here no less than 551 artefacts were collected. Though they are all made of quartzite, the assemblage includes a wide variety of tools. Among the 31 types of tools, there are only a few handaxes, cleavers and choppers, but a large number of scrapers of varied types (11), denticulate tool types, borers, and four types of burins and three blades.

What is commendable in this article is that the authors have given us a detailed classification and description of important types, and also drawn our attention to sites in France, where such a co-existence of handaxes and Middle Palaeolithic tools is found. Only accounts like these advance our knowledge.

Scientific Analysis

In Europe and other countries human occupation of a site in the past was not so easy to detect, for want of abundant archaeological evidence. Hence, in countries like Denmark phosphate analysis of soil was found very useful.

Similar tests used in our sites like Daimabad by Prof. Joshi, Dr. Majumdar and Shri Deotare[16] have shown that in the black soil below the earliest Savalda culture, and the modern black soil the phosphate content is comparatively very little. Among the five protohistoric cultures, that of Savalda is the most marked. Naturally this should pose a question. Was it due to its longer duration ? Thus, the scientific search is unending.

14 Prehistoric Investigation in Sagileru Basin, *Man and Environment*, Vol. II, 1978 *pp*. 32-40.

15 Pant P.C., Vidula Jayaswal and Rakesh Tiwari, *Man and Environment*, Vol. II, 1978, *pp*. 21-34.

16 Phosphate Analysis and Archaeology, *Man and Environment* Vol. II, 1978, *p*. 72.

Kashmir

Ever since de Terra and Paterson's work in the Kashmir Valley, now nearly 50 years ago, no purely prehistoric work had been undertaken. But the valley shot into prominence when a huge flake and an Abbesillian handaxe were found in a stratified deposit of the second glacial or the interglacial period at Pahalgam. This chance discovery was systematically followed up by two well-qualified research parties.[17] Hence, there is little doubt that Kashmir proper was inhabited by Early Man, exactly when his fellow beings appeared in the Soan and other rivers of the Punjab, about 500,000 years ago. However, the number of artefacts is still small, and only a regular work in the Kashmir Valley can augment this number. Again, the aim should not be merely the collection of a few more tools, but the fuller ecological background of the Early Man in Kashmir and the foot-hills of the Punjab and Himachal Pradesh.[18]

Garo Hills, Meghalaya

Assam in its original geographical connotation was known for the occurrence of ground or polished stone tools. These were generally assigned to the Neolithic Period. When, therefore, tools like the typical handaxes and cleavers were found, the local scholars were hesitant in putting them in the Early Palaeolithic Era. Their hesitation was removed when the reddish silt which covered the underlying pebble gravel from which the handaxes and cleavers were recovered, was declared to be similar to that found all over India.[19]

This visual observation had to be tested by a scientific analysis.

Manipur

Not only in the Garo Hills, but even in the adjoining Manipur, palaeolithic tools have been reported from a rock shelter at Khangkhui, Ukrul.[20] The exact site is located about 11 km. southeast of the Ukrul town. The tool seems to have been made on a banded variety of chert or sandstone, and made on a flattish, ovallish pebble. Unlike the weathered and patinated tools from the Garo Hills, it still retains its sharp, projecting point.

Champaner

Since the discovery of handaxes of an advanced Acheulian type and thick blades at Bahadarpur on the Orsang in Central Gujarat, as far back as 1942, no further work

17 *PPIP*., p. 35 ; and Joshi, R.V., S.N. Rajaguru, R.S. Pappu, and B.P. Bopardikar, "Quaternary glaciation and palaeolithic Sites in the Liddar Valley (JammuKashmir." *World Archaeology*, Vol. 5, 1974, pp. 370-79.

18 Joshi, R.V., S.N. Rajaguru, G.L. Badam, and P.C. Khanna, "Environment and Culture of Early Man in Northwest India a reappraisal, *Journal, Geological Society of India*, Vol. 19, 1978, pp. 83-86

19 Sankalia, H.D., *PPIP*, 1974, *p*. 41.

20 *AIR*., 1968-69, *p*. 20, pl. *XXIII*.

had been done. Now Dr. R.N. Mehta and his colleagues have discovered 64 palaeolithic tools near the mediaeval town of Champaner. These have been fully reported by Dr. Mehta.[21] He has also noticed among these tools, a few blade-like tools, whereas Mrs. Allchin and Dr. Hegde picked up burins and blades from an old sand-dune at Visadi in its vicinity.[22]

These discoveries should not be viewed in isolation. For in our 1942 collection from Bahadarpur, there was a thick blade flake, from which a long blade had been removed.[23] Thus Central Gujarat does seem to have a long tradition of blade tools. What is necessary is to tie up all these casual discoveries by a prolonged search around Pavagadh, which seems to have been the headquarters of Early Man and his descendants.

Modasa

Another potentially rich site is Modasa on the Mahjam river in Northeastern Gujarat. Here Acheulian handaxes and other tools of quartz and quartzite were discovered in 1573.

The Belan Valley, and other Sites in Southern U.P.

For the last several years Prof. G.R. Sharma, his colleagues and pupils of the University of Allahabad have been regularly collecting Stone Age tools from the Belan Valley. These explorations have been extended to other districts of U.P.—such as Allahabad, Azamgarh, Banda, Mirzapur, Pratapgarh, Sultanpur and Varanasi.

These discoveries have been so far reported very briefly in *Indi n Archaeology—A Review*.[24] From these notices one can only say that the entire region is very rich palaeolithically, but what its position is in the development or evolution of the Stone Age Cultures in India, can only be assessed, only when the various collections are *scientifically* classified, and described metrically, according to Bordes' typology.

An example of sustained environmental studies which indeed do nothing more than explain the background in which Early Man lived in Saurashtra and Konkan is available in three investigations by the students of the Deccan College, undertaken at the Ph. D. level. In each case, the discovery of stone tools was not regarded as an end in itself, but a problem to be tackled from a wider point of view. This is best explained by Dr. V.G. Lele's work in the Bhadar Valley.[25] A few handaxes were found at Rojadi near Rajkot. Though the number of tools was indeed small, "the signficance of this was tremendous. Briefly, it meant that Saurashtra could not have been under the sea, as some geologists had thought. Even if this had happened only on the periphery, the effect of this could be traced in the existing river courses.

21 *Prehistoric Champaner*, M.S. University of Baroda, 1978

22 Allchin B. *et al*, *The Prehistory and Palaeogeography of the Great Indian Desert*, London, 1978.

23 Sankalia, H.D., *Investigations* into the *The Prehistoric Archaeology of Gujarat*, Baroda, 1947.

24 1968-69, *p*. 33; 1969-70. *p*. 35; 1970-71, *p*. 35; 1971-72, *p*. 43. 1973-74, p. 25.

25 *Late Quarternary Studies on the Bhadar Valley—Saurashtra*, Ph.D. thesis (unpublished), Poona p. 25. University, 1972.

Now such an investigation cannot be undertaken by a student from the Social Sciences. He should be preferably from the Science side. Anyway, Lele's study as well as that by Ashok Marathe[26] and Statira Guzdar[27] have shown that Early Man preferred to live in the interior, or higher reaches of the river, whereas the coastal area in Saurashtra was occupied, deserted and re-occupied during the Mesolithic, Chalcolithic and Early Historic times.

MESOLITHIC

Bagor

The mesolithic site of Bagor, near Udaipur in Rajasthan, was excavated for several seasons by Dr. V.N. Misra of the Poona University. His explorations have been described at length in several articles, and a detailed account has been given by me.[28] Now Dr. K.A.R. Kennedy reports that he has studied the human skeletions; this study of his is awaiting publication.[29]

Belan Valley

Rescue operations in the Belan Valley have once again brought to light the remains of several burials, and hearths with animal bones. The exact site is situated to the east of Mahadaha village, and, in fact, seems to represent a cemetery of the Mesolithic period. While broadening the old canals, the workmen found some human skeletons. This fact was brought to the notice of Prof. G.R. Sharma[31] who directed his colleagues to undertake a proper excavation. This they did at the most inopportune time i.e., in extreme summer heat. But the results were very rewarding. About 15 skeletons buried in shallow, oval graves were found. In two instances, there were double burials. And these turned out to be that of a man and a woman. In one grave these were found to be kept side by side, in another, they were kept over one another (as is an earlier case).

The bodies were kept in an extended position, with arms kept along the sides. The orientation was observed, not to be uniform; the head either on the east or on the west, the legs being in the opposite direction. This would not necessarily suggest that the people thus buried here belonged to different ethnic group for lack of fuller evidence in this respect.

In two instances, the skeletons were found with an earring and a necklace, and in

26 *Environmental Background—Hiran Valley*", Ph.D. thesis (unpublished), Poona University, 1977.

27 *Quaternary Environment...Konkan*, Ph.D. thesis (unpublished), Poona University, 1975.

28 *PPIP.*, pp. 260-66.

29 *Man and Environment*, Vol. II (1978), p. 116.

30 For the account of the earlier discovery, see *PPIP.*, pp. 237-40, and Sharma, G.R., Mesolithc Late Dwellings in the Ganga Valley, *PPS.*, Vol. 39, 1973, pp. 129-46.

31 This account is based on *Dinamana* (a weekly published by the *Times of India Group of Newspapers*, August 20-26, 1978, pp. 24-27.

another with a necklace only. All made from antlers. This is the first time that skeletons of this period have been found with ornaments.

The early Mahadahins were quite tall. Among the intact skeletons, one male measured 6ft. 3 in., and a woman 5 ft. 10 in. in height.

These people seem to be in a hunting-and-food-gathering stage, because the animal bones found in their extant habitations or graves consist of wild animals—such as the cow/ox, buffalo, boar, deer, barasingh and elephant. But the fact that these bones were either fully or partially charred shows that after hunting, the animal was butchered and roasted over specially made *chulahs*, several of which st'll survive. Again many of these *chulahs* are in groups, suggesting a community living. Both these should be regarded as advanced traits. A study in depth of the earrings and necklace should be interesting, when the details with drawings of both are available.

Meanwhile, the suggested date of 8000 B.C. should be regarded as most tentative because it is based on only one sample; secondly, another date which has not been publicized is much later. However, the date is not so much important as the fact that in in this old plain of the Ganga, we have extensive traces of a hunting-cum-incipient-agricultural stage, with the additional advantage of knowing the type of people who practised it. But this knowledge can be obtained only by a sustained, well-planned project in which the archaeologist should be assisted in the field by a physical anthropologist, geologist, and a botanist. For the people who had so many *chulahs* must have been partially dependent on the natural vegetable food. And this can be ascertained by a careful floatation technique. If the archaeologist is intelligent enough he might lay his hands on coprolite. And these when liquified by a chemist, and examined under a microscope will enable the experts to know what food these people ate as well as the diseases they suffered from. Thus, the site has so many potentialities which, if fully exploited, can help us in having a full picture of the life of man some 5000—7000 years ago in the old Ganga Valley. Also by using the Amino acid racemization, it will be possible to date *each sketeon*. This method has been described is the section on dating.

NEOLITHIC

Southern Neolithic

During the decade and a half the Southern Neolithic zone has been intensively explored and written upon, so that we now know fairly well its chief characteristics. Excavations at Brahmagiri were followed by that at Sangankal, then after a lapse of some 15 years at Tekkalkota, T. Narsipur, Hallur, Kodekal and Palavoy. Besides the brief notices in *Indian Archaeology Review*, not only detailed reports have been published on all these sites, but twice the significance of all this work has been noted and illustrated. Hence, it has been thought advisable to omit all details from this very general account.

The first thing is its extent. Until 1968, we had thought that the neolithic culture was confined between the Eastern and the Western Ghat. Now with the discovery of

32 *I.A.R.*, 1968-69, p. 24.

Neolithic site at Guddey Maddi near Shimoga, the culture has crossed the Sahyadris and moved on to the coast. At Honavar, a ground stone axe was found near the ancient Siva temple.

Whether this was a chance find, or a solitary outpost can be easily ascertained if these localities have no material suitable for making stone axes. Whether such an extension of the Neolithic will be found on the Eastern coast cannot be said without intensive field work.

While we should await this information, we now know that these people whose principal tool for digging, cutting and dressing wood was a polished axe of various shapes and sizes, chisels and adzes made from fine grained trap, at times diorite, lived in round huts erected with undressed wooden posts in the midst of an enclosed terrace, among granite hills, or on the bank of a river like the Kaveri. These huts had a mud or clay wall up to a height of about 4 ft. from the ground, while the upper three or four feet were thatched, so also the roof. Such simple mud and grass huts can be seen at the foot of the Tekkalkota hill, and practically in the countryside throughout South India. These huts were further equipped with a huge slab of thick, flat surface stone, which was used for grinding grain as well as grinding and polishing stone tools.

The inhabitants of such simple huts had a fairly large number and varied types of pots and pans. These were generally greyish in appearance, like their stone tools and granite hills, but a few of the shapes, such as the vessel like the tea kettle of our own days, but without the handle, and a small, footed cup not only excite our admiration, but make us wonder about the special functions these vessels were expected to perform.

An intersting aspect of these hill-and-plain dwellers was revealed at Tekkalkota. Here was found the palm of a hand, etched out on a boulder, whereas the likeness of a huge bull, not at this very spot, was etched only in outline on a boulder at the foot of the hill.

That these etchings were executed by the Neolithic people was proved by the recovery of the lid of a vessel, bearing a beautiful decoration by puncturing four animals—a bull, a deer, a cobra, and a peacock. It is probable, that many of the paintings and etchings found in the last century at Sangankal, Bellary district, and now at Piklihal and elsewhere in the granite hills were done by the Neolithic people. Thus these were the first artists of South India.

Some more information is also available about their attitude to the dead. As at Brahmagiri and Piklihal the dead at Tekkalkota were buried in the house floor (probably after the dead was exposed to the sun for sometime). But at the last mentioned site, it was also found that during the later phase, the people buried the dead in a number of pots and placed several vessels in the burial pit. Thus probably arose the custom of burying the dead in coffins, or stone cists and dolmens during the subsequent Megalithic period.

It is also now known that these people, though leading a pastorial life and living on milk and milk products, also consumed the meat of the stock they kept, besides hunting deer, etc. What is more, they were also the earliest users of *ragi* and *kulath* in India.

Another important question that might arise is "Was the life of the hill-dwellers exactly the same, as that of those living on the plains" ?

At present we do not see any difference. For, besides the flimsy houses of wattle and daub raised on a stone or a mud floor, the pottery, and stone tools—polished as well as those made for cutting and piercing and made of chert/chalcedony—show no difference. To this repertory Palavoy added even axes made from the shoulder blade of an animal.[33]

Hallur gave a specimen of a "head rest," mentioned a century ago by Foote as one of the characteristic possessions of the Neolithic people of South India.

Thus, there is much to learn about human life 4,000 years ago. Unfortunately, exploration work is at doldrums at present, as no work has been done during the last 12 years. However, whenever this is resumed, it must be on the most modern lines, having clearly the objectives in view. Unless the excavations are of an inter-disciplinary character, they will not serve any useful purpose.

Kashmir Neolithic

As in South India, but in a completely different geological context, lived the Neolithic people of Kashmir or the Jhelum Valley. While the former lived on terraces enclosed by huge boulders, the early Kashmirians lived on flat, open river terraces, in most beautiful surroundings. In the distance rose the snow-capped mountains, but all around them was the placid river-flowing through ever green plains, many of these now turned into ricefields. Thus, the contrast cannot be more striking between the Northern and the Southern Neolithic. The former appears to be richer in content as well.

Of these flat-topped terraces, known locally as *karewas*, the lower ones are dark red, but the top 30 feet or so are yellowish, and furnish proofs of their being deposited, when there was a huge lake in Kashmir during the late Pleistocene (about 20,000 years ago). It appears that some 5,000-6,000 years before man came and occupied these flat topped terraces. Instead of building huts with wood, clay or stone, he chose an easy way, to wit, of digging a fairly broad and very deep pit in this lake clay with ground or polished stone tools. It appears that wooden ladders were provided to come out or go in these pit-dwellings whose tops might have been covered with bundles of dry grass. Besides a variety of stone tools he also manufactured several kinds of tools from bone and antler. Among these tools, large and small bodkins and needles suggest that these and various kinds of scrapers of bone, as well as polished stone, must have been used for preparing clothes from animal skins and also pressed wool (Felt).

Now such habitations are likely to be found all over these *karewas* terraces. In fact, I have myself seen three such sites. Besides the one at Burzahom, there is one each at Gurf Kral, and Martand. Now, if one or two of these habitations of Early Man in Kashmir are fully excavated from a multi-disciplinary approach, in which, besides the excavator (archaeologist), and his usual assistants—draftsmen and

33 Rami Reddi. *Pre and Proto-histors of South-Western Andhra Pradesh*. 1968 (unpublished thesis) Poona university.

surveyor—also participate some others—e.g., a botanist, a palaeontologist, and a chemist who can undertake the analysis of soils at various levels, we can have, in a foreseeable future, a worthwhile insight into the life of these Early Kashmiris, as Prof. Grahame Clark had into that of Early Man at Scarborough in England, or as did Prof. Lumley have in Nice of France. The questions which need satisfactory answers are : Did this Kashmiri stay on these terraces throughout the year ? What were his means of subsistence, besides hunting ? What was the most favourite animal? In the plains, we know that the cow, ox was the main supplier of animal protein. But, here in Kashmir, this quadraped possibly did not exist then, and a cold loving animal, which was easily available, must have been hunted or domesticated.

Another important question is : Did these people live at the same spot all the year round ? or did they resort to some more sheltered place—a cave—during the winter ? And the most important of all the question poses itself : Who were these people racially, physically ? Indo-Mongolian or Indo-Aryan Iranian, as would appear from a study of their pots and pans and other objects, recovered from the excavations at Burzahom. All these and many more issues await a scientific investigation. But hitherto even a simple report has not been published. And we do not know what happened to the human skeletons ? Have they been reburied in Calcutta or Deihi ? and if so in what cemeterv ?[34]

34 According to a very recent study just received (10.11.78), the locssic deposition over the exposed upper Karewa deposits in the Kashmir Valley are C. 8000-50,000 *B.P.* and hence Neolithic Agarwal, D.P., *et al.* Cyclostyled News.

PART III

Indus Civilization

Extent

During the last decade and a half, the extent of the Indus civilization, which was already staggering by any standard, has now been found not only to reach the frontiers of the Indo-Pakistan continent, but is said to have extended upto the southern bank of the oxus on the frontiers of Iran and the U.S.S.R. New sites have been excavated in India, and Pakistan ; yet the origin of this most extensive civilization in the world still remains obscure.

Its script is still undeciphered, though efforts have been made by the Finnish, Russian and Indian experts to classify its script with the help of a computer. Other scholars find the computer to be an "obstacle." One of them—Dr. Fairservis thinks that it is proto-Dravidian, whereas Shri S. R. Rao thinks it is proto-Sanskritic.[1]

Lothal

Within India, the excavations were completed at Lothal, while the full report has not yet been published, a fairly comprehensive account has appeared.[1a] This, however, does not explain the occurrence of a *single rotary* quern found at the site.[2] Nothing like this has been found in any of the Harappan sites, or any Chalcolithic site in India or for the matter of that in Western Asia.

1For a berief review see, Sankalia, H.D., Reading the Mind of the Harappans *Science Today*, June 1978, pp. 28-35.

1a Rao, S.R., *Lothal and the Indus Civilization*.

2 *Ibid.*, pl. XXXIC.

This rotary quern which is Indo-Roman in origin, however, proves that Lothal was in occupation until the early historic period (c.100 A.D.). All these remains have been washed away, leaving behind only such heavy stone objects as this one, and a few potsherds of the Kshatrapa period. These have also been collected by other visitors, but not reported by the excavators.

Kalinbangan (See Fig. 13)

Like Lothal, another important Harappan site—Kalibangan—in the former Bikaner State was excavated for several seasons. Though interim notices have appeared in *IAR*, and some articles, full report is awaited.[3]

Kalibangan is important from several points of view. It seems to have been the "third" capital of the Harappan civilization. More than that it has given remains of a pre-Harappan settlement. This indeed seems to be a "town." Here lie the origins of urbanization. And when we can appreciate this when we are told by Pakistanis that the ancient Sarasvati Valley has literally hundreds of such sites.

Surkotada

Further, the excavation of a Harappan fort, all built of stone, at Surkotada in Kutch and the discovery that all or almost all the place-names in Kutch with the ending *Kota* have remains of the Harappan period, suggests that the Harappans had built a regular chain of forts to guard their route from Sind to Gujarat.

Indeed, what is necessary is a joint Indo-Pakistani expedition. If this expedition work for about 5 years in this region, then surely we shall know the origins of the Harappan civilization.

While in India we are lamenting the loss of Kalibangan because the reports of both the scholars, who so skillfully excavated its site have not yet seen the light of the day, some important discoveries are being made outside India.[3a] And since this subject is not confined to this country, the significance of this extra Indian work is briefly mentioned and commented upon for the general reader.

GOMAL VALLEY AND OTHER SITES

Extensive remains of the Indus civilization have been found in the Gomal Valley by Pakistani archaeologists at Gumla, and other sites on the Afghanistan border. In the south in the former Bahawalpur State (now called Cholistan) Dr. Rafiq Mughal has found numerous sites of the Indus, pre-Indus and post-Indus Cemetery H sites. Whereas in the east and north-east, Indian archaeologists have reached the borders of Kashmir, in the west, the Americans have dug very systematically adopting some new techniques, the sites of Allahadino and Balakot. Fortunately, both excavators, Dr. Fairservis (Jr.) and Professor G. Dales and their colleagues have published fairly detailed reports of their work. (See Fig. 4)

3 For a brief summary see *PPIP.*, pp. 342-56.

3a Even within India, Harappan site have been discovered is Northern Gujarat.

Balakot

Balakot is located some 80 km. north-west of Karachi on the flood plain of the Windar river. Four seasons of excavations have yielded the remains of two main periods. viz., pre-harappan and Harappan. The pre-Harappan culture is called Balakotian. Interestingly, preliminary studies suggest that the Balakotians were not directly involved in the process that culminated in the mature Harappan civilization. They were basically part of a southern Baluchistan-Makran coastal cultural milieu extending westwards, perhaps, as far as the Persian Gulf.

More important, these earlier inhabitants of Balakot already possessed some of the attributes usually credited to the Harappans, such as the regularly oriented structures with uniform sized mud-bricks, fine pottery, a bull-cult, knowledge of copper-bronze, and long-distance trade. Thus some of the main elements of an urban or civilized life were not unknown to the Balakotians.

The Harappans came after considerable time, and laid out their settlement like a chess-board. One of the major industries that of the manufacture of bangles from marine shells was practised at Balakot. A whole workshop along with tools was found.[4]

Cultural Concourse in Haryana

This period of nearly 20 years has witnessed the emergence of a pre-Harappan culture, which was but barely exposed for the first time by Dr. R.E.M. Wheeler before Partition at Harappa, not only at one place or site, but at several sites in Sind, Bahawalpur, Northern Rajasthan, Punjab, and as far as the Jammu-Kashmir border on the east. Traces of this culture have also been found on the Afganisthan border in Pakistan. This pre-Harappan culture, called variously by site name—"Kot Dijian" in Sind, "Sothi" or "Kalibangan-1" in N. Rajasthan, and "Siswal" in Haryana, and "Mandi" in Jammu, was followed by the Harappan over all this vast region.

LATE OR DEGENERATE HARAPPAN

Later this mature Harappan either disappeared completely. or deteriorated, losing some of its characteristic pottery forms and finishing, and refinement in city-planning. This phase has preferably been called by scholars as the Late Harappan, one. What happened exactly after this at Mohenjodaro and Harappa is not known, because the excavators 50 years ago were ignorant of the importance of pottery work which alone could have given some clue to this question, even if it had bothered them.

It appeared from a few small excavations before 1960, for instance, at Ropar, Punjab, that there was a hiatus or a gap in the cultural development. This view seemed to be supported by excavations at Hastinapur and other sites in Western U.P. But now evidence is forth coming from some sites in Haryana, Punjab and Jammu that the

4 Dales, George, *Man and Environment*, Vol. II, 1978, p. 108.

Harappan; or the Late Harappans did not disappear completely. At a few sites. for instance, at Bhagawanpura (Haryana) and Dadheri in Punjab, they managed to live with the Painted Grey Ware people.

The same thing seems to have happened at Nagar and Katpalon, and further eastwards at Manda on the Chenab, now in Jammu.

Hakra or Pre-Harappan Civilization

What do these signify in terms of folk movement, and from the still larger questions of the rise and fall of urbanization and formation and undoing of kingdoms, while (pure) archaeologists would go on counting the various pottery fabrics and docketing them here and there? These discoveries when juxtaposed with what has been recently by reported by American excavators from the Sind coast, and extensive explorations by Pakistani archaeologists in Cholistan (former Bahawalpur State), then no longer we should regard the Indus civilization as the earliest one in the Indian subcontinent. It was immediately preceded by one in which the people had a sense of town-planning, building with moulded and kiln-baked bricks and made a distinctive pottery. Since no site either in Sind (Kot Diji, for instance), Rajasthan (Kalibangan), Haryana (Banawali, Bhagawanpura), or Manda in Jammu is fully excavated, and its still earlier antecedents are not known, we cannot say that this was cent per cent indigenous.

As if this was not intriguing enough, we are told by Dr. Mughal that he has found 24 sites of the "Hakra assemblage or Complex" and dates it back to c. 3500 B.C. Thus the Hakra or the Vedic Sarasvati Culture would be the earliest in North-western India!

Their pottery at Kalibangan showed some Iranian influence, particularly in the design, decoration and certain other techniques of pot-making. Prof. George Dales had a similar experience in his four seasons of excavations at Balakot, as mentioned earlier.

If we plot this scattered evidence on a map, we find evidence of town-planning on the Arabian coast in Sind, in Northern Rajathan, in Haryana and Punjab, even before the mature Indus civilization. At present, we do not know whether the inhabitants of these regions were culturally and ethnically one, for no detailed knowledge from any site is available, primarily because, the remains of this pre-Harappan underlie those of the Harappan with or without a gap. However, there is some evidence to presume that some or all these people were connected with their fellow members having by blood or culture f.om Iran and further west.

Except in Cholistan, as reported by Dr. M.R. Mughal, nowhere a pre-Harappan site unencumbered by later deposits has been found.[5] All the hitherto well-known sites, as well as the new sites like Banawali, had been occupied by the Harappans. It is these people that fortified the settlements at some places like Kalibangan—with thicker mud walls—and brought about a complete or thorough regimentation in town-planning,

5 Mughal, M.R., "*Four Years of Archaeological Discoveries*" *in Cholistan*. Summary of Lecture, February, 1977.

burial practices and other aspects of life such as the manufacture of pots and pans, for eating, drinking and storing.

Not only objects of faience but also gold were common. These, so far thought to be absent in the pre-Harappan, have been noticed in the pre-Harappan Banawali, and also in the degenerate, post-Harappan Bhagawanpura, and Dudheri. Usually, beakers and gablets are said to be absent in this phase. Why ? We have not given to this question sufficient thought from the point of view of the life-style of the two people—one using them regularly and the other doing without them. However, we shall never know the exact use of these beakers and goblets in the Harappan household unless we see a Harappan house more contextually, *keeping an eye on the sherds as they occur every minute.*

Late Harappan

It has also been found that there was a decadence in civil life, particularly the method of making houses during the Late Harappan period. This had already been noticed at Mohenjodaro, but with the evidence from Harappan East Punjab and Jammu we can regard it as a general feature.

However, even this feature disappeared and we find people living in round or semi-circular huts, for instance, at Bhagwanpura, Dudheri and Nagar. Later after settling down, houses were built with mud walls, and for the first time we are fortunate in having a complete house complex with no less than 13 rooms at Bhagwanpura.[6]

At Bhagwanpura, Dudheri, Nagar, Katapolan and Manda, the two or three cultures like the Harappan, Late Harappan and the PaintedGrey Ware were found interlocked, that is, there was no stratigraphical or even cultural break between the two deposits. Not only many distinctive features of the Late Harappan were found to be continued in the Painted Grey Ware phase, but even design elements and shapes of the former were copied by the latter inhabitants.

However, this amalgam is not found elsewhere, for at instance at Siswal. This may be explained in several ways. The one set of such theories that appears to be most probable is the one that took place before our eyes in post-partition India. In some cases, the Sindhi and Punjabi migrants lived among or with the Rajsthanis, Gujaratis, and Maharashtrians. Elsewhere they established separate new colonies *in these very regions. In the former cases, some mixture of life style will be found, but not much in the latter.*

In the same way, we have to postulate at least two waves of people, one in about 3000 B.C.-2500 B.C., with markedly Iranian or West Asiatic pottery traditions. For the present, we cannot say for certain whether these people came by sea or land through the northwestern passes from Baluchistan and Afghanistan. The most inportant thing is that these people were not nomads, or if they had this tendency, this was curbed and they settled down in Sindh, Rajasthan and Haryana and probably in Punjab as well.

5a Jagat Pati Joshi, in *Man and Environment*, II, p. 99.

Colonization

How shall we describe this movement ? I have called it "colonization"[6] 'for here the people came with a ready-made knowledge of arts and crafts and even town-planning. This description is not liked by some scholars. We can give it up as soon as we find definite traces of indigenous development of all these at any of the above-mentioned sites, Kalibangan, Banwali, or Balakot.

How this pre-Harappan cultures developed into the Harappan we do not know. At Balakot there is a complete break, but not so much elsewhere. Any way, for nearly 500 to 700 years—a truly-astoundingly-long period for India or any country in the world, people in Sind, Punjab, Haryana, Rajasthan and Gujarat (Saurashtra area) enjoyed the fruits of a settled way of life. What is intriguing is that how the rest of India—Madhya Pradesh, Uttar Pradesh, Maharashtra, Bihar, Bengal etc., escaped the total or partial impact of this well-ornanized culture. If it had trade contacts with the west, by sea and overland, it must have had some contacts with the rest of India as well.

That this is a reasonable speculation is now proved by the discovery of Late or Degenerate Harappan, not only in many parts of Haryana, Punjab, Jammu and Kashmir and Uttar Pradesh, but also Madhya Pradesh, Gujarat (Saurashtra and other coasted areas like Malvan) and Maharashtra. In our present knowledge, these might be regarded as refugee colonies, for almost everywhere the art of city-planning and good, brick houses is not witnessed, probably not because the people were ignorant, but because they did not have the material wealth, available only by trade, commerce and good government.

It is therefore, surprising that at Bhagwanpura and Dudheri, objects of faience and gold were found. It is not known whether these have been found in the distant Daimabad in Maharashtra.

Daimabad (See Figs. 12 and 60-67)

Daimabad is an excellent illustration of cultural conflict and adaptation. It also seems to confirm the view of the author that Malwa, and Maharashtra were colonized by a people from the north. The earliest among these were probably the folk from a site on the south bank of the Tapi or Tapti, called Savalda. Since the houses of this earliest occupants are buried under three later habitations, not much is known about their house plans, except that they were round, mud houses, with a hearth, a quern and muller, and a distinctive pottery with arrow-like paintings. The dead were buried in the house.

This Savalda culture underwent a change when a people acquainted with different traditions came. The houses were now large and made with typical Harappan bricks. The pottery underwent a radical change. It was made in a large kiln, the clay was well levigated, and included several large storage jars, though the typical Harappan goblets and perforated vessels seem to have been absent. The seals also appear in a

6 Sankalia, H.D., *Prehistory of India*, 1977.

very simplified form; just a few letters without any animal. All these are indicative of the changed character of the Harappans, whereas the burial in the house, though in an extended form, was a sort of absorption of the already existing local practice.

However, these migrants or colonizers were supplanted by a people from Malwa. Not only the signs of reading and writing disappeared, but also brick-built houses as well as the sturdy pottery. In the place of the latter two, we now find mud-made houses and beautiful pottery, with graceful *lotas* (small jars).

A significant change in the daily life of the people is indicated by the introduction of pots with a long—almost vertical spout. However these vessels at this stage do not have such a sharp carination and constricted neck, which we see in the succeeding Jorwe Culture. Why was such a change brought about ? Was it simply stylistic or dependent on the life-style of the people ?

Finally the three or four types of burials should not be merely looked upon as three or four different methods of disposing of the dead. But the persons who were buried within them, particularly those in one extended burial of the Late Harappan period, should receive immediate attention from the physical anthropologist. For here is an excellent chance of knowing the various physical types which were responsible for these varied cultures.

One thing seems to be certain. That all the our culture-bearers were not indigenous inhabitants, but some of them immigrants or colonizers from the north, and still others could have been from the hypothetical Aryan tribes. However, with the question of migration from the north to the south being established, attempt should be made to fix scientifically the routes these people must have taken. Particularly, this search is necessary in the case of the Harappans, for they were definitely a northern or north-western people. And before they reached Daimabad, they must have stopped (settled) on some of the major rivers like the Narbada and the Tapi. One of the likely sites was Manoti on the Kali Sindh or Chambal, but it is all a plausible hypothesis as the settlement is now no more, having been submerged under a dam.

However, there must be other sites in between the Narbada and the Godavari, and and these must be searched and the route or routes scientifically brought to light.

Daimabad Bronzes (See Figs. 14-17)

As early as May-June 1974 the bronzes here described were found at Daimabad in the Srirampur Taluka of the Ahmadnagar District in Maharashtra. The scholars of the Deccan College immediately visisted the site, and photographed the finds in the Police Chowky, where they were kept. However, owing to the restriction on publication, nothing was written on these unique bronzes. Now some comments only can be made in the light of a brief article by Sri S.R. Rao which recently appeared in the *Illustrated London News*, March and April 1978.

The four bronze figures, bear the undernoticed broad charactertstics :

(i) a humpless bull standing on a flat plate, supported by four solid wheels;
(ii) an elephant, in a like posture, but in this case the wheels are missing;

(iii) a rhinoceros, with its four legs, resting not on one single plate, as in (i) and (ii), but on separate ones, each supported by a pair of solid wheels, and

(iv) a chariot, quite open, and meant to be used in war, rather than for domestic purposes. It is driven by a driver who is standing, with a dog posted on the pole in the same way.

Though these bronze figures at Daimabad have been compared with those from the the Indus Valley proper, Harappa and Chanhu-daro, and Lothal, yet these are *unique* in *every* way.

Weight and Size

The bronze figures of the Indus civilization are light and small in size (4 to 15 cm. in height), whereas those of Daimabad are 20 to 35 cm. in height. Hence, these are exceptionally heavy; the elephant without wheels weighs nearly 20 kgs., whereas the remaining three together weigh 20 kgs. Unlike the true Harappan bronzes which are made by the *cire perdue* (lost wax) process, these are solidly cast.

Their Make

We have to answer another question as well. Though Shri Rao says in his article cited above that he had found evidence of a furance at Ambhore, a Late Harappan settlement, 20 km. from Daimabad, so far no full report on this excavation has been published. Even if there is evidence for such a furnace, two further questions face us. "Could it be proved that these bronzes were made from the copper refined at Ambhore ?" For a credit-worthy reply to this query we must have good evidence, as we had at Ahar. An analysis of the slag from Ambhore and that of the bronzes themselves should answer the question.

The same question would be true of the row of furnaces *in situ*, found at Daimabad itself. These furnaces, from about one to two metres in diameter, are built of thick potsherds and plastered with mud and lime. One furnace has two openings to allow molten metal to flow into a pot placed at a lower level. Such furnaces, found at the Jorwe level, had walls 4 centimetres thick with a hole in the bottom for molten metal to flow into sand-lined pits.

Inspite of these differences which are indeed striking, Shri Rao thinks that these are truely Harappan or Late Harappan. However, one must take into cognizance several questions presenting themselves about their functions, and fabrication. To start with, were they made locally at Daimabad or at Ambhore, nearby ?

Whether these are Harappan or not, the most important question is : "What was the purpose for which such heavy, wheel-drawn animals were made ?" The most likely purpose is ritual. They could function only in a temple with a smooth floor. Hence the excavators should have searched for such a structure.

Most important, copper is indeed rare in Maharashtra; so Shri Rao thinks that either of the Raichur, Chitradurga or southern Rajasthan sources was exploited. But then

again, a technological connexion either with southern Rajasthan or Karnataka mines has to be established. And this only a scientific study of material from both the sources and the nature of the copper used in the bronzes, can say.

When we turn from these questions of fabrication to those of use or function of all these four heavy bronzes, we have to ask ourselves in which cultures in India gods, goddesses and their associates are or were taken into a procession ? As far as we know, there is no trace of a god being carried in a procession in the Vedic or post-Vedic religion. However, we have the *Rathayatra* (Chariot-moving) ceremonies in later Hinduism, and many of the South Indian temples until recently had wooden *rathas* in the temple complex.

Some such ritual must have been there in the Indus religion if the bronzes are truly Harappan. Further their weight suggests that so much copper could have been used (economically) only at the parent sites like Harappa and Mohenjodaro. Secondly, from the point of view of the function, vehicles even with solid wheels, could be used in a flat, sandy country, such as Sind, and the Panjab, and not in the rocky, uneven region of the Deccan.

Thus, technologically and archaeologically, these bronzes would be more at home in the north than in the Deccan. Ethno-archaeologically, the bronzes could be mediaeval rather than prehistoric.

Anyway, this chance discovery has given unique bronzes and, with them, considerable food for thought. Objection to their age has been raised on scientific ground as well. According to atomic absorption spectrometry, these bronzes show more than 1% arsenic, whereas no arsenic alloying has been reported from the chalcolithic cultures.[7] Though this might be true, all the 13 specimens from Mohenjodaro, analysed chemically by Mahammad Sana Ullah give varying amounts of arsenic.[8] This was added for hardening. A similar alloy was also used in Egypt. Thus the presence of arsenic in the Diamabad bronzes might show that they were manufactured in the Indus Valley proper, and not in the Deccan, and brought here by immigrants. Hence, it could be a real Hoard, buried by a people in hurry.

Painted Grey Ware (PGW)

The third folk movement was that of the Painted Grey Ware people. So far the Painted Grey Ware has been found to be confined to Punjab (East and West), Jammu, Haryana, Northern Rajasthan and Uttar Pradesh. Probably, it occurs in Sind, as it does in Cholistan (Bahawalpur), where a few sites have been found, as mentioned elsewhere.

The problem is about its initial direction : Was the movement from the east to the west and northwest ? If it is from the northwest, "is the movement connected with the bearers of the Grey Ware found buried in Swat and several other sites in Afghanistan and Pakistan ?"

Agrawal, D.P., Krishnamurthy R.V,, and Kusumagar, Sheela, "New Data on the Copper Hoards and the Daimabad Bronzes", *Man and Environment*. Vol. II, 1978, pp. 41-46.

8 Marshall, John, *Mohenjodaro and the Indus Civilization*, Vol. II, pp. 84-85.

Though some scholars have recently attributed this "Border Grey Ware" to the Aryans, still one cannot ac ount for the total absence of such shapes in the Painted Grey Ware proper, even though one may argue away the absence by saying that the Aryans in India adopted the local practice. But what local practice? There are no precedents. On the contrary, the two or three characteristic Painted Grey Ware shapes are typically Indian and characteristic of the life-style of people in U.P.[9]

So at the moment, in the absence of more positive evidence, we should regard the border Grey Ware and the Painted Grey Ware as distinct, and belonging to two culturally and perhaps racially different groups of people. If we thus rule out the northern or north western origin of the Painted Grey Ware then we have its occurrence only in U.P., Haryana, Punjab, and Northern Rajasthan. This distribution is not sufficient for ascertaining the movement from the east to the west or *vice versa*. For the hitherto known C-14 dates are not very helpful that way. Barring the one date, C-14 date from Atranjikhera, all the rest fall between 800 and 400 B.C.

Sonkh (See Figs. 50-54)

The excavations at Sonkh, near Mathura, conducted most systematically by Dr. Herbert Haertal and his team for eight years, are important from several points of view—

(1) For giving additional confirmation that the Painted Grey Ware culture flourished between 800 and 400 B.C.;
(2) For tracing the history of temple architecture;
(3) For the cult of Skanda and Naga (and incidentally suggesting, that the cult of Gopalkrishna was a much later one); and
(4) For fixing the date of Kaniska I in the first century A.D. on the stratigraphical evidence of coins.

Remains of Painted Grey Ware Culture at Sonkh

The remians of the Painted Grey Ware culture lie almost at the bottom; Levels 37-40, Within the area under excavation, no remains of mud or mud-brick walls were found except "a system of two parallel running ditches of different width with a small rampart in between." It is therefore presumed that the houses in the earliest period (in this locality) might be of a non-mud material. Only later in Levels 36-35 mud became the principal material for building houses.[10]

The most important finds in the earliest levels, besides the numerous fragments of the Painted Grey Ware, were two intact specimens of the red utility ware. A large *Ghata*, 26 cm. high, was found in the open beside a *chulah*. This must have

9 Sankalia, H.D., Function Signification of the O.C.P. and P.G.W. Shapes, *Puratattua*, No. 7. 1974, pp. 48-52.

10 Based on the reprint of *German Scholars in India*, Vol. II, 1976, kindly supplied by Dr. Haertal.

been used for storing water. A smaller one decorated with scratches on the shoulder, and dent in wedges very probably served as *lota*. Probably both these shapes still survive in U.P. and Punjab.

Two radio-carbon dates of 620 and 575 B.C. from Levels 39 and 38 seem to confirm the current dating of Painted Gery Ware between 800 and 400 B.C.

Hence the interlocking of the two or three cultures at Bhagawanpura, Dadheri, and Manda should not be given a very wide bracket 1600 B.C.- 1000 B.C., but a much narrower one, say 1200-800 B.C. At the same time, efforts should be made to date these sites by C-14 method. What is also necessary and this has been stressed by earlier writers on this subject—that these movements were gradual, and even within each region, or sub-region, there were several waves. Thus, Suraj Bhan has well pointed out that owing to the shifting of the Yamuna and the Saraswati and the Drishadvati eastwards, the Harappans moved on to the Upper Haryana and the Ganga-Yamuna Doab in the later phase.

This movement might have been soon followed by the arrival of the Painted Grey Ware people. Hence the coexistence, or interlocking in the Upper Haryana, East Panjab and Jammu. Thus for a fuller understanding of the history of this vast region, wherein lie the several roots of ethnic and cultural strands of Indian culture, we need the data as provided by Bhagawanpura and Dudheri from several sites. For a further understanding, sites like Bhagawanpura and Banawali should be fully excavated.

Painted Grey Were—Village Culture

Now the final question is posed: could this ware belong to the Mahabharata War Period ? Prof. Lal and all the subsequent writers, including myself and Dr. Vibha Tripathi, think that the culture represented by the Painted Grey Ware and the things so far found with it suggest that it was at most a village culture with "advanced economy."

This conclusion goes against our assumed view of the Mahabharata War Period, when there were several states, each with a specific name such as Kuru, Panchala, Chedi, Kekaya, Sindhu-Sauvira, Magadha, etc, each with its own capital city. So if we regard the Painted Grey Ware as a village culture, we shall have to revise our opinion about the Mahabharata times.

However, when I was preparing this work, it occurred to me that the Painted Gery Ware could very well be described as a culture which followed in the wake of Mahabharata, after the destruction of the kings of Northern India, with their armies, in Northern India—Punjab, Northern Rajasthan, Haryana, U.P. and Bihar. Thus, the Painted Grey Ware could very well be regarded as a post Mahabharata culture.

Likewise, the Painted Grey Ware cannot be considered as a ware which indicates the advent of the Early Aryans in India. At best, the Painted Grey Ware can be called a pottery which had the largest distribution next after the ware which indicated the spread of the Indus civilization a thousand years earlier. This distribution was surpassed within three hundred years by the Northern Black Polished Ware. While these conclusions may be modified by future excavations, at present we can say with

confidence that the Painted Gery Ware was a deluxe table ware of the Upper Ganga Valley, between 800 and 400 B.C.

Probably, the iron technology and the fine pottery technique which this period had introduced, led to further developments in both during the next 400 years, *C.* 400 B.C. 100 B.C.

Dating the Painted Grey Ware

Since its discovery, 20 and more years ago, efforts have been made to date this ware—both its initial occurrence and continuance. All the efforts so far including even the most recent ones, are concentrated on the projection of C14 dates. In these heroic efforts the nature of the data is lost sight of. The first and the most important fact is that the samples are obtained from very small excavations or surface sites. While the C14 method itself has come in for considerable criticism, because the basic assumption that the radioactivity remains constant has been successfully challenged, and hence the various dates are in need of re-calibration. The important point to bear in mind is that charred grains, and not wood, supply the most reliable samples. For the wood might be from a tree that was cut long ago, whereas the grains at the most can be two or three years old.

Again, there are two other scientific methods, such as archaeomagnetism and amino acid racemization. The latter is particularly useful for dating fossil bones, and could be used for dating bones from Hastinapur and other sites (*World Archaeology, 1975*, Vol. 7, *pp.* 160-61 and *p.* 185). What is more is that an all-sided study of the culture is necessary. For instance, the scholar who has written on the subject, has tried to study the fragments of the Paints Grey Ware from the subsequent layers, and say whether the original shapes continue. So also we would like to know that the shapes like those found at Sonkh—both intact—are found elsewhere and in what layers.

In the absence of such ethno-archaeological studies, scholars elsewhere may think that the Indians have not learnt any other *mantra* (*recipe*) *than one* for pottery, stratigraphy and fortification taught by Wheeler 30 years ago.

MALWA CHALCOLITHIC

Our excavations at Navdatoli had already given indication of three or more cultural strains.

Now excavations by the Vikram University and the State Department of Archaeology, M.P., has given some more indications of what the original sources of these cultures might be. As yet, detailed reports of all the excavations are not available, nor have I had an opportunity to handle all these varied material. But being well acquainted with the early material from Navdatoli and Ahar, and then our own excavation at Kayatha, I can perhaps notice the differences much better than many other scholars. Still the subject is like a field strewn with pitfalls. Only a prolonged handling—and that too preferably in the field, because office-studies can at best be partial and not superficial seeing of the pottery from various sites, would enable one to make a proper

estimate. So with this proviso, the following account is given. It is based on the article by Dr. Wakankar, *Chalcolithi Cultures of Malwa*."[11] At present no *clear* chronological succession is available either in Central Malwa or Northern Malwa. But distinct features are said to be noticeable at Azad Nagar, Indore and Manoti. However these sites are only partially dug, and that of Manoti was opened some 20 years ago, when the Harappan influence or penetration in Madhya Pradesh or Maharashtra was little suspected. Hence Wakankar's classification and suggested chronological succession have been given here without comment. What is most interesting is the richness of the material, and a clear indication of the movement of the cultures from somewhere in the north to the south. The former was abundantly demonstrated at Navdatoli.

According to Wakankar Manoti on the Chambal is a Harappan or late Harappan site. Here the traces of structural remains are indeed the fortifications with bastions of the Harappans. This site also gave characteristic Harappan vessels (*Fig*. 5). The chart, given by Wakankar, illustrates bowls, some with channel spout, low necked jars and a dish-on-stand. However, one misses, in this chart, the characteristic Harappan goblet and the long cylindrical, perforated vessel.

The next phase seems to be Azad Nagar, Indore, followed by Kayatha I. The latter as shown by me earlier, does contain some elements which recall the pre-Harappan at Kalibangan, in particular, the dishes with incised decorations.

Thus, a migration of the Harappan is suggested by a few pottery fabrics. Still we do not know whether another Harappan trait, viz, the chert blade, occurs at Manoti and Indore. These did not figure at Kayatha.

Next is the Ahar phase, now clearly established at Kayatha, with its characteristic white painted black-and-red ware, as well as the hign necked, jars with grooved shoulder and neck and the stylized bulls.

This is followed by the rich Navdatoli phase, wtih its goblets (footed cups).

The non-appearance of the true Jorwe bowls and spouted jars among these three or four Malwa cultures, definitely shows that this was a truly Maharashtrian culture, which had reached the Narmada, but not *vice versa*.

There were regional and sub-regional differences, and these are quite natural and to be expected in a vast area with distinct physiographic, ecological and ethnic features. Some of these like Mahalpur, Vidisha, and Piparialorka are known only by their pottery. Of all these Navdatoli is the best known and fully reported. And the above review fully bears out that the validity or usefulness of grouping the rich assemblage of pottery at Navdatoli into four distinct cultural groups according to fabrics and shapes. For these do show the existence of ethno-socio-cultural groups, which all came together at Navdatoli or the residents of Navdatoli had absorbed all these elements.

Also well-known is the pottery of Kayatha, dug by the Vikram University[12] and the Deccan College.[13]

11 *Prachya Pratibha*, Vol. IV, No. 2, pp. 1-19 and a weekly from Ujjain.

12 Wakankar, U.S., *The Vikram* Journal of the Vikram University, 1967.

13 Ansari, Z.D. and Dhavalikar, M.K., *Excavation at Kayatpha*, Poona, 1975.

This season 1977-78 Dr. Wakankar dug at at Mandasor—ancient Dasapura. Here in Trench 7 he found below the weathered black soil layer the charred remains of a Chalcolithic house. And this was no ordinary house. For it had four rooms, the central one was the kitchen. It has two large *Chulas*, the larger one with two mouths, as at Ahar. Nearby there was a stone slab. This was very probably not for sitting, as Wakankar thinks, but was meant for grinding, as in the kitchen at Ahar, though another one lay on the right of the *Chulah*. Remains of bowls, *thalis*, *lotas* etc, were also discovered. In a smaller room to the south, there were 16 large storage jars, and also a stone quern for grinding. In the room to the west there were again 7 or 8 huge vessels. In another room to the north, one of the pots contained charred grains. On the walls one could see evidence of plaster and white-washing with lime.

Some of the pots are beautifully painted, with geometric designs and animal figures like the bull and deer.

Curiously, this kitchen also contained the skeleton or bones of a child in two pots. How these urns were kept is not specified. This is the first clear evidence of this practice in Malwa. The one, found in 1953 on the northeastern corner of Mound I, at Navdatoli was almost on the surface, Similar child burial was also encountered in the layer containing Kayatha culture at Azad Nagar, Indore. However, it is not yet possible to conclude that the children were invariably buried in pots (one or two urns), as in Western Maharashtra. For, Wakankar also found a skeleton in the lowest layer. And this he attributes to the general practice of burying a skeleton (when a house is built). If this is the interpretation, then again it is not possible to conclude that it was a common practice to bury the dead in the house as in Maharashtra.

While one should welcome this latest knowledge the about the Chalcolithic in Malwa, it also underlines the necessity of a horizontal exposure of each regional or sub-regional culture. This alone will enable us to appreciate fully the contribution of various ethnic elements. The most important question is: "Are or were all these cultures indigenous or were any of these Aryan, or *pauranic*, as the names of "Avanti" and a Dasarna" used by Wakankar connote?"

It is also no less curious that so far none of these five or six regional cultures has yielded the characteristic goblets (footed-cups) and the white-slipped Ware with paintings in black or sepia, found so far at Navdatoli.

Hence, it would be worthwhile to make a well-planned attempt to concentrate all our attention on these problems.

Maharashtra

Maharashtra, like Madhya Pradesh, seems to have had not one single culture during the Chalcolithic 'period' but at least three or four as the present evidence goes. And who would have suspected this, some 40 years ago? The older monument-minded archaeologists could only think of the Satavahanas, or at best Ashoka, remembering his Sopara edicts. But Jorwe, Nasik, Nevesa, and then a string of such sites in the valleys of the Godavari, Pravara, Bhima and Ghod in the Poona and Ahmadnagar districts, and on the Purna and numerous such other sites in the Tapi Valley do raise before

us a picture of the first early farmers, or agriculturists trying to eke out a living with the barley they or their forefathers has learnt to grow in the north. These people had brought with them the fine art of pottery, and possibly the knowledge of reading and writing, as the very recent evidence from Daimabad, a site on the Pravara, indicates. These peaple also lived in brick-built houses as in the Indus Valley. But all this knowledge was lost—how soon or gradually we cannot say exactly at present.

The next wave of immigrants were from Malwa. These people introduced wheat in the diet, and also some variety of the fine painted pottery.

However, their houses were very modest. Just round or square huts, built with thin mud walls and roofs with bundles of grass and bamboo frames. These people stored barley in fairly deep and wide, lime-lined, silos or underground pits, but for wheat they had to build a round mud platform, over which a large cylindrical basket made of split bamboo or cane-like creeper was placed with a contrivance for taking out the grain, as and when required. As in Malwa, they preferred to cook on three-armed *chulah* with a clay border to prevent ash from spreading out.

For all the daily needs in the home or in the field, in hunting and occasionally in war, they had to rely on short parallel-sided and curved-back blades and points of chalcedony. These, though not so large and thick as the chert blades of the true Indus Valley, seemed to be equally efficacious, found as they are in hundreds in all the sites. However, wherever possible, these people supplemented chalcedony kit with axes and adzes of dolerite and copper or low grade bronze axes, daggers and chisels. For heavy duty work, such as grinding and pounding, saddle querns were used, with plano-convex mullers, or round ball-like strikers or pounders. The later might have been used as missiles with a sling for fighting.

All over Northern Maharashtra, including the present district of Pune, Ahmadnagar and Nasik and probably Dhulia, Jalgaon to the north, and Kolhapur to the south, the Malwa influence was ousted or replaced by another which in our present knowledge seems to be the hallmark of this region—Western Maharashtra. True, the basic way of life—residence in round or rectangular mud huts, anddepen dence on small blades as well as restricted use of copper/bronze for tools/weapons, and subsistence on beef, pork and barley and wheat—did not change for some reason, yet unknown. Nevertheless, not only was wide repertory of pots and pans, as witnessed in Malwa, for instance at Navdatoli, given up, and merely a limited number of shapes were adopted, but also the method of making these pots was discontinued. This change is so striking that we have to attribute it to a different set/group of people. Following the archaeological convention, this new group of people have been called the "Jorwe" people after the type site Jorwe, near Sangamner on the Pravara. Though some idea of their life had been given by the excavations at Nevasa, Daimabad, Bahal, Chandoli, and Songaon, a fuller picture is now available from our seven year excavations at Inamgaon.

Testimony of Inamgaon

An important discovery is of the kiln within the habitation. Not only it is as well made as in Harappan or Indus civilization (as known from Mohenjodaro, Chanhudaro

and Lothal with radial flueholes, and a sloping passage for stoking fuel), but in addition, it was furnished with a number of large, thick, plano-convex "cushions" with a hole in the centre, and an indentation on each side, so that the potter could arrange these cushions as required, and place the vessels on them for baking. Such cushions seem to have been used for baking highly angular-bellied *lotas* with long spouts. Probably, all such vessels were thus individually baked. Hence, all Jorwe pottery has a metallic ring. And this feature in addition to its specialized shapes of bowls and lotas, and the absence of flat-bottomed dishes for eating, help us to distinguish this Maharashtra culture from that of Madhya Pradesh, and the Neolithic in the south, as well as the Harappan, etc., in the north. These particular shapes of the Jorwe pots also suggest their peculiar habits of eating and drinking, or the existence of liquid foods, and the absence of dishes suggest the absence of food like *chapaties* (leavened bread) or *bhakhars* (thick, unleavened flat bread). Even the small goblets for sipping some kind of spirituous drink (as suggested by the shape of the vessel) were made in this way. No wonder that for the archaeologist pottery is not only the most useful tool, but also a very sensitive one as an indicator of distinctive cultural zones. (See Fig. 18)

For nearly five centuries (C. 1300-700 B.C.) this culture flourished in Western Maharashtra and why and how it disappeared is not yet known. No traces of deliberate destruction have been found in the large-scale excavation at Inamgaon. Repeated droughts, due to insufficient showers in the rainy season, might be one of the reasons. The whole region, particularly the eastern parts of the Poona district and the whole of Ahmadnagar district, bear evidence of the climatic feature. Archaeologically, it might be traced back to this period *C.* 700 B.C. Its onset first made useless the irrigation canal or pond at Inamgaon, built during its hey-day, *C.* 1200 B.C. This *brought* about a gradual deterioration in the living standard of the inhabitants. Particularly the pottery is now coarser, and without that red colour. It is dull brown. The houses once again became circular in plan, and smaller in size. The most important change that is visible at present in our present knowledge was the acceptance or advent of the newcomers, the megalith-builders from the south. In our first or second season of excavation we began to find a bowl or two in each small house we laid bare. And we wondered how this typical black-and red-ware vessel had found its way to Inamgaon. The explanation came two years later, when we noticed stone circles at Pimpalsuti and elsewhere In the Sirur Taluka, and excavated one and found the remains of this megalithic cultures. Of course, due to the unavailability of large stones, these are indeed a poor copy of the Andhra-Karnataka megalithic graves. But the influence is undoubted.

These people were probably accustomed to eke out a living in a semi-arid environment.

A special feature of our seven-year excavations at Inamgaon may be mentioned. The excavation is not only primarily horizontal, but the intention is to know by all possible means the way how a group of people at a particular level lived. But, what was the way of life in each house (home) or group of houses that we carefully laid bare ? This has indicated that in the latest phase, craftsmen, such as, the lime maker, goldsmith and the potter, lived in round, ons-room houses on the western end of the

mound. There were several such one-room houses. In an earlier period (Phase II), the houses in the centre of the mound were large, and also square or rectangular. These were probably occupied by the headmen of the village, as would appear from a room of silos as well as large storage jars kept above the ground, or platforms, specially made for storing grain in a cylindrical container.

A new feature was seen in the burial methods. While all the burials, so far found, were in pots or in an extended position, placed in a shallow, specially dug pit, a person was found buried in a sitting posture in a huge, clay urn with four short legs. This is certainly unique, and indeed, may be regarded as the precursor of the sarcophagus. (See Fig. 19)

Theur

While Inamgaon is situated to the north-east of Pune, Theur is situated 24 km. to its north. Hear there are a number of stone circles, varying in diameter from 18 to 28m. When two of these were excavated, these turned out to be circular huts of the Chalcolithic period, and not burials of the Megalithic, iron-using people.

Besides chalcedony blades, copper bangles, beads of jasper, chert terracotta figurines and toy cart wheels, the bulk of the finds consisted of pottery. This surprisingly consisted largely of black-and red ware. It has a thin fabric, is well baked and resembles that of Rangpur IIC. Two of the characteristic shapes of the latter, viz., the chalice or the stemmed bowl, and the carinated bowl also occur. Again, both these vessels bear graffiti marks, which are said to be evolved from the mature Harappan.

This black-and-red ware in the light of our present rather limited knowledge shows contact with Saurashtra. But, we do not yet know whether it originated there, or went there from somewhere else. Hence, it is possible that both Rangpur and Theur derived this ware from another source.

Whatever it may be, this cultural influence ceased, and Theur, like Inamgaon and many other places, became a home of the Jorwe people.[14]

While the excavations at Theur gave evidence of the existence of two or three Chalcolithic cultures, that at Sastevadi[15], on the bank of the Mula-Mutha, just opposite Theur, showed the prevalence, in the earlier stages, of the Southern Neolithic trait, with a little admixture of the Malwa variety, consisting also in circular houses built in a row. Later this Neolithic was supplanted by the Jorwe culture.

Thus, the Poona district had the honour of hosting no less than four distinct Neolithic-Chalcolithic cultures, between 2000 and 1300 B.C. and extending further to 700 B.C.

Prehistoric Art

During these two decades namely, the 'sixties and seventies, some definite idea has been obtained about both the beginning and development of prehistoric art in India.

14 *IAR*, 1969-70 (1973), pp. 28-29, pls. *XL-XLIII*.
15 *IAR*, 1971-72, p. 35.

While this knowledge as yet cannot match with what we know of Western Europe, yet, the fact remains that a beginning has been made. Since this has been reviewed in some detail elsewhere,[16] only a brief reference will be made here.

There is no evidence so far either in India or elsewhere of any specific artistic creation, either for self-decoration or self-expression. However, one should certainly mention the emergence of a sense of symmetry and proportion in the Early and the Middle Palaeolithic. This sensibility was not confined to only a particuler part of India, but can be witnessed all over India.

Then, during the next phase—the Upper Palaeolithic—we see the true birth of art in the engraved ostrich shell ornament, from Patne in district Jalgaon of Maharashtra, on the Belan site in U.P. and also Bhopal, where Dr. Wakankar has found an engraved ostrich shell near the Ravishankar Nagar. Thus as in Western Europe, man had begun to decorate himself with ornaments and also fashion figures in bone after himself.

To this period also belong several rock-paintings at Bhimbetka and other sites in Madhya Pradesh, according to Dr. Wakankar. These paintings are in green and crimson red. The subjects treated cover several aspects of life, such as, sex, birth of a child, nursing and collection of honey.

Since this subject is still in its infancy, an l requires a critical appraisal,[19] I have merely cited and reproduced a few scenes from the account given by Wakankar. For instance Wakankar cites several paintings of chariot. All these have spoked wheels. And we know for certain that chariots with spoked wheels appear much later. What we know from the Indus civilization is a small copper-bronze chariot from Harappa, and even the chariot from Daimabad, if it is Harappan, has solid wheels. The same thing is true of various weapons, particularly the compound bow. The history of rock-art can then be followed at Bhimbetka, where there is definite evidence that it was practised during the Mesolithic. A few of these Mesolithic rock-paintings have been illustrated.

Art in Indus Civilization

The Indus civilization was already known from its three of four superb stone torsos and the two copper female figurines. However, unexpected light on several more aspects of art were thrown when a fresh study was made of the numerous terracotta figurines from Harappa and Mohenjodaro. Again, it was definitely proved on technological grounds that the small sandstone torso from Harappa was Harappan. We can thus confidently say with Sir John Marshall that the Indus artist had anticipated the Greek artist by 2,000 years.

The history of the prehistoric art does not end here. Just as today, the village woman all over Malwa (until recently) wore bright coloured coarse clothes, in the same way that 35,00 years ago people used a beautiful painted pottery. Some of the most

16 Sankalia, H.D., *Prehistoric Art in India*, New Delhi, 1978.

17 Wakankar, V.S., Pragattihasik Citravithika, Bhimbetka, *Marathwada Samshodhan Mandal Varshik*, 1976, p. 110.

18 *Ibid.*, p. 113.

19 One of such studies has been recently completed by Dr. Yasodhar Mathpal. It is entitled *Prehistoric Rock Paintings of Bhimbetka*. Ph.D. thesis (unpublished) Poona University, 1978.

beautiful specimens have been found at Navdatoli, opposite Maheshwar. Among these I had already drawn attention to the artistic *lotas*. Now a foreign architect regards the Indian *lota* as functionally the most beautiful daily ware. And this it certainly is, compared to the mugs, cups and glasses. And among these lotas the Navdatoli specimens are, indeed, the best.

3

Swat or the Gandhara Grave Culture

Swat (See Fig. 5)

Swat today forms a part of the north-western corner of Pakistan, bordering Afghanistan. This is part of ancient Gandhara, which was once a division of India.[1] It was also called "*Suvastu.*" This name is indeed significant. It means a "good place for habitation". The word has acquired a semi-religious connotation in several Indian languages. And even today the Hindus observe the ceremony of *Vastu*, when a newly built house is to be occupied. So, it is most likely that the Aryans on their onward march to the plains of Punjab from Iran and further westwards might have lived here for some time. However, no traces of habitation earlier than the Indo-Greek and early Buddhist period were found during the last one hundred years. Even when some burials on the slopes of hills, overlooking the rivers—Swat and others, were found by Prof. Tucci over thirty years ago, he thought they were of the early Buddhist period.

The credit of recognizing the pre-historic nature of burials at Timargarha, goes to Prof. A.H. Dani. The name Suvastu, however, was more connotative of the beauty of the surroundings than of the fertility of the soil and availability of the living area. For except the slopes of the hills over-looking the various rivers, and a little strip of plain ground on the river bank, the rest of the area is rocky. Not much cultivation is possible. Though no remains of grains—wheat, barley, and rice—have been found in any form, nonetheless these could have been grown only in small patches, along the river, where water was easily available, and the soil fertile. The hill-slopes

1 See the map in *Ancient Pakistan, III*, 1967, *Fig.* 1.

could have been used, as today, for grazing herds of cattle, goat and sheep. In addition to these traditional pastoral modes of life, the inhabitants had also domesticated the horse, for its bones have been found buried in several graves; it was a valued companion. Among the goods recovered from graves, at times some equipment for the horse is also found.

Though some idea can be had of the settlement pattern, nothing can be said about the village planning, nor about the nature of the houses. For so far neither Dani nor the Italians under Stacul, even in the subsequent excavation at Aligrama, have found a complete house with all it requirements. What can be definitely said is that the houses were made of rubble stone masonry. These were but rarely plastered with mud. Long slabs of stone of schist were cut from the living rock to serve as floor for the dead bodies. At Timargarh large slabs of stone were used to make the box-like graves; here the presence of circular and rectangular storage rooms with a connecting platform (as well as pits, for instance, at Aligrama) suggests the probable storing of grains. At Balambat were also noticed remains of a fire altar, and ritual seats for the worship of fire god. (See Fig. 6)

This is certainly insufficient to give us any idea about the culture—the way of life—of the people. Hence, we have to turn to the graves.

The Graves (See Fig. 10-11)

The graves dug on the stony slope of the hills overlooking the rivers at several sites, belong stratigraphically to three phases or periods. Secondly, not only their contents, but the methods of disposing of the dead vary from period to period. Thus we are able to have a good idea of the change in the material as well as the spiritual culture of the people represented in the three periods in the graves. Dani's designaton of the culture as "Gandhara Grave Culture", hence, is quite apposite.

After the extensive excavations by Dani at Timargarha and Balambat[2], many more sites have been discovered. So far excavations have been conducted at Buthara II, Katalai I and Loebanr I, Butkara, Barama, Timargarh, Balambat, and Aligrama.[3]

In the first type of graves single individuals are buried along with funerary pots. In some cases, these skeletons are complete. It is quite excusable to digress here a bit from the main feature, to have some flashbacks on the pottery unearthed. There are at least three types of pottery vessels, a cooking pot in red ware, a bowl-on-stand (red ware), a tall drinking vase, or an open mouthed small drinking cup in grey ware.

Be that as it may, the second type of graves is the urn burial. Here only a few bones, along with ashes, collected after cremation were placed in urns. These urns contained bones of more than one individual. These urn burial with bones of several individual, was given up in Period III. Instead, whatever bones were available (after exposure of the body) were disposed of in the regular fashion of inflexed burial. In some instances, the male and female were found buried face to face, clasping each other. If these were husband and wife, what would be its significance ?

2 Dani, *Ancient Pakistan*, III 1967 *p*. 13 (map).

3 Stacul, Giorgio and Sebastiano, Report on the Excavations at Aligrama (Swat, Pakistan), 1966, *East and West*, 1972, and 1975.

Along with these changes in the burial practices, there is a change in pottery forms. As Dani says, "whether we take the cooking pots, or the bowl-on-stand or even the tall drinking glass, we can easily trace the course of evolving shapes".

Grave Goods

Because of poverty of the region, there are few other items. However these are helpful in tracing whatever progress these pepole had made. The most important of these articles in the first two periods, happen to be only objects of copper such as long, slender pins with top heads, (head pins or scarf pins), eye-needles indicating use of stiched clothes) and ornaments like rings, finger-rings, beads and bangles.

Iron

The iron objects are exclusively confined to Period III. These include spear-head, arrow-heads, nails and spoons, a "flat rectangular axe"(in Swat), and cheek bone of a horse, harness, etc. The spear and arrow-heads show a thickened midrib. Other items include beads or net sinkers (*Pl.* I and *Pl.* IV-V). These are biconical and seem to be incised, as at Ahar. Unfortunately, the photographes are not clear, so the design cannot be made out.

Among the animal figurines a humped bull, a ram's head and a cat have been found at the Balambat settlement, whereas a jar lid showed a handle with the shape of a horse.

While two complete skeletons of horses were discovered in Swat, the rest of the animal bones include goat, horse, stag, sheep, hare and snake.

Pottery

These graves belong to two periods—Copper/Bronze and Iron. The bearers of these belong respectively to two physical types, the so-called proto-Europoid and the Mediterranean. Their dominant pottery is grey, with characteristic pot forms: e.g.;

1. bowl-on-stand;
2. pedestal-based deep bowl;
3. cooking pot-on-stand,
4. hour-glass type of drinking vessel;
5. narrow-necked bottles;
6. bottle pitchers, and
7. deep bowl.

These findings and the fact that these compare well with those from Hissar II B and III C in northern Iran[4], have lead Dani to suggest, after a careful consideration, that in these two groups we have two waves of Aryans, who on their way to India, had lived

4 Dani, *Ancient Pakistan, III, 1967, pp.* 43-45.

for some time in Gandhara. The evidence is no doubt circumstantial.

Though we cannot say anything definite on this point, one has to point out, as Thapar has done, that though in our present limited knowledge these Gandhara Grave people might be regarded as having a good claim to be grouped with the Rigvedic Aryans,[5] all the same one has to bear in mind that at Gumla, a site to the west and south-west in the Gomal Valley, there is some evidence of destruction by arson of the settlement of the earlier people by those who came later on. So, one cannot explain away the differences in the ethnical types, as between the people buried in Graves I and those in period III. Again, the people of Period III are said to have robbed the graves of Period I. Would this thing happen if the people were culturally one ?

Going back to the pot forms, which happen to be the only reliable material evidence we have from these graves, we find that none of the seven characteristic pots, either in Grey or Red ware, has been found further eastward in Punjab. Here only the flat-based dishes occur, along with the straight-sided bowl and the *lota* in the Painted Grey Ware culture.

Now, if these were really Aryans, did they give up their original way of life, as soon as they entered Punjab and U.P. and took to eating rice in the flat-based dish ?

Even this dish of the second wave or group of people need not be the rice-plate of the Aryans. For rice was not a staple diet of the latter, either now or in the centuries of yore.

For the moment, we should welcome the knowledge which the Gandhara Graves offer, leaving the question of its attribution to this or that people, to be resolved afterwards on the availability of more precise information.

So, let the Aryan question remain still an open one. Just as there is no evidence of the typical Gandhara Grey Ware having penetrated further east, there is no evidence, likewise, that the typical Painted Grey Ware had also gone to Baluchistan, and Afghanistan or originated there.[6] It is a pottery with its distribution confined to Punjab, N. Rajasthan, and U.P. Its three characteristic forms, the bowl, dish, and *lota* are typically Indian. We should, therefore, hesitate to regard this ware as that of the Early Aryans, inspite of the renewed plea by Lal[7], with a little higher dating of the C-14 bracket from 800-400 B.C. to 1100-700 B.C..

This pottery can well be regarded as of the Later Aryans, more particularly of the tribes who participated in the Mahabharata War. These represent small kingdoms: Sindhu, Kekaya, Kuru, Panchala, with stock breeding and agriculture as the main bases of economy, supplemented by hunting.

And if Lal and others insist on characterizing the Painted Grey Ware as a "village culture", then, I think, we shall have no alternative but to place it in the post-Mahabharata period, as suggested by the consensus of C-14 dates, for during this

5 Thapar, B.K., "*The Archaeological Remains of the Aryans in North-Western India*" in papers presented in the *Indo-Soviet Symposium at Dushanbe, 1977.*

6 Even in Cholistan, two-third portion of the former Bahawalpur, now in Pakistan, only a few Painted Grey Ware sites have been found by Mughal, M.R. Vide "*Four Years of Archaeological Discoveries in Cholistan*", Cyclostyled Copy).

7 Lal, B.B., "The Indo-Aryan Hypothesis *Vis A Vis* Indian Archaeology", *Indo-Soviet Symposium at Dushanbe*, 1977.

period, no large cities had yet sprung up.

I had already pointed out in the seminar at Aligarh, as far back as 1968, that the Painted Grey Ware cannot represent both the Early Aryans and those of the Mahabharata War. Even in his latest paper Lal cites the evidence of rice from Hastinapur. Now this grain was unknown to the *Rigveda* as well as to the *Avesta*. On this ground alone, we would be justified in dissociating the Early Aryans from the Painted Grey Ware.

Probably all these were small or large villages, though a house complex at Bhagawanpura with 13 rooms makes us wonder whether this is of the head man or the ruling chief.

Thus, at the moment we might regard the Gandhara Grave people as one who had some cultural affinities with people from Eurasia and, particularly, with those from Hissar II and III, with the probabilitv of some of them having been Early Aryans.

The Painted Grey Ware people can be variously designated. They may be called "*Atharvavedi*", because they were rice-eaters, "Iron Age Aryans", because they used iron tools and weapons, and also "horse breeders", because the remains of the horse are found in their houses. Lastly, it is likely that these Aryans probably represent the Mahabharata tribes. particularly the Kurus, Panchalas and Kekayas.

The Aryans

On the question of the Aryans, there is yet no conclusive evidence as to either the time of their advent in India or the route by which they did it. Meanwhile, the late Shri Amrit.V. Pandya[8] really "turned the tables", when he interpreted all the old, and the little new evidence from Rana Ghundai in Baluchistan, and Gumla and Hathla in the Gomal Vally, where terracotta figurines of a saddled horse were found,[9] of the reported occurrence of the horse bones and a terracotta horse head at Mohenjodaro, the horse figurines and paintings at Rangpur[12] and, finally, the remains of the horse at Surkotada in Kutch.[10] He commendably opined that either the Harappans were themselves Aryans or a part of them arrived in this sub-continent before 3000 B.C. It is these Aryans that developed the spoked wheel chariot in India, and it is they that had gone to Western Asia. Thus the Kassites, the Hyksos and the Mittani were Aryans ! Of course, this was the old, orthodox Indian view, but now it has been bolstered up with archaeological evidence. Shri Pandya also adds that for some reason these Aryan dynasties disappeared from Western Asia during the 12th century B.C., because they could "not face the on-slaught of the iron of the Assyrians".

Thus the Aryan question has a re-orientation, and we must again reopen the come of authorship of the Iron-age in India !

8 Pandya, A.V., *JOI*, 1975-76, p. 150-54.
9 Dani, A.D., *Archaeology of Pakistan*, Vol. V, 1970-71.
10 Joshi, J.P., in *JOI*, XXII, 1972, pp. 136-8.

Further Excavations in the Swat Valley

Excavation at Loebnar III, situated on the Jambal Khwar, a small river in the Swat Valley, made by Giorgio Stacul, gave evidence of a settlement phase which is ascribed to Period IV in Swat Valley prehistoric sequence. On the basis of C 14 datings of some layers at Ghaligai and Aligrama, Period IV seems to have been well established between 1800 and 1700 B.C.

From our point of view what is important is the likelihood of the pottery of this Period, particularly its black-grey burnished pottery, with its typical shapes, being of North-Iranian origin. There was an earlier pottery—that of Period III—which showed affinities with the Neolithic Phase I of Burzahom. This has been stressed by Rafiq Mughal after his excavations at Sarai Khola, near Taxila. He had perceived its possible links with the Neolithic culture of Yang-Shao in Northern China.[14] This contact with China continued, as can be inferred from the occurrence of a green jade bead at Loebnar III and an ornamental object of jade at Ghaligai.

That Kashmir (Burzahom) was in contact by trade or otherwise is also suggested by the occurrence of a rectangular stone knife with pierced holes. Though this was supposed to be a knife, a personal examination of the object at Srinagar by me in 1968 suggested that it was more probably an ornament, worn around the neck. Such ornaments in various materials can still be seen in Kashmir.

However, what is significant is the massive presence of the black-grey burnished pottery. This might be not only the result of the adoption of new techniques (introduction of the fast wheel) but be also due to the cultural and ethnical changes. Such a fine pottery might be the distant precursor of the Painted Grey Ware, though its forms are quite different from that of the Indian Ware.

1 Rafiq Mughal, "Excavations at Sarai Khola", *Pakistan Archaeology*, Vol. 8, (1972), pp. 1–112. (This has been cited by Stacul in his article in *East-West*, Vol. 26, (1976), p. 28.

Megaliths

Karnataka

In 1962 it appeared that the megaliths, that is, huge stone monuments, were a special feature of South India. Preliminary classification had shown several regional types, while Wheeler's excavation at Brahmagiri showed that these were not so old as once believed. This was confirmed by subsequent excavations at Sanur, Maski and elsewhere. However, it was apparent that there were probably many more regional types which a careful exploration, followed by the excavation of one or two, would reveal. Within Northern Karnataka there are more than 350, as shown by Dr. A. Sundara's careful exploration. This region has rich and varied geological formations, and it was, indeed, a natural presumption that the various megalithic types might have some relation to this varied geological legacy.

However, studying and grouping the megaliths according to the main or characteristic geological formations, such as,

(i) Bhima and Kaladgi and their sub-groups (quartzite and sandstone),
(ii) Dharwar rocks (schists, quartzites, grained limestones),
(iii) Peninsular Gneissic, and
(iv) Deccan Trap.,

Sundara[1] came to a rather unexpected conclusion. He said, "The varied tomb types in different geological zones are essentially due to the traditional affiliations rather than environmental influence."

1 Sundara, A. *The Early Chamber Tombs of South India*; 1975, Delhi, p. 218.

It has now to be determined how old these traditions are. But, it is remarkable that though the houses of these people at Hallur, and further south at Paiyampalli, were of a very simple type, these people were not only adept in quarrying all kinds of stones, but they made a judicious use of these rocks. They employed a particular stone for a particular part of the tomb.

Again, these people were excellent architects-engineers, as one can see from the plan of the passage chamber.[2] This is quoted *in extenso*, to give an idea of the architectural skill of the builders.

Passage Chamber (See Fig. 21)

It is observed that the plan of the passage chamber is either trapezoidal or rectangular. The hind orthostat is generally held in between the side orthostats, the lateral edges of which usually outstretch it. The trapizoidal plan does not seem to be accidental, but is intentional, as it is repeated to a large extent. This plan is resorted to obviously to secure stability to the chamber built with slabs without binding material. For, in this plan the rear part is wider than the front. That is to say that the side orthostats are not parallel to each other, but slightly converge towards the front. Consequently, the rear orthostat, now making an actue angle with the side orthostats, can not fall inwards, as it is checked up by them. Thus, although the plan is simple, it is intelligently preferred.

The hind orthostat acts at either end as buttress to the side orthostats. Further, the front edges of the side orthostats support the front uprights, the lateral edges of which invariably outstretch them. Owing to this kind of arrangement of the orthostats, at the top corners, these now appear and act as cross-support to carry more securely the load of the prodigious capstone of uneqaual thickness and of irregular shape, producing pressure of varying degrees, haphazardly.

Even the erection of pillars within the chambers of the two types—the circular passage chamber and the chamber of Greek or Latin Cross type of Terdal group—is on the principle of equidistance. The provision of an intermediary circle in some cases of the circular passage chambers is obviously necessitated for supporting the radially arranged multiple capstone, as shown in *figs.* 5 and 8, in order to avoid possible disturbance to the intermediary circle, which was supported by the cairn packing on exterior side also. And to hold up the exterior cairn packing, another circle or rectangle at the edge of the packing is necessary. Thus, the provision of double circles or a circle and a rectangle is functionally justified.

"Thus,interlocking of the orthostats of the chamber tombs providing cairn packing, externally buttressing the chamber to avoid outward collapse, centring the tomb within the enclosing circle or rectangle or perfect circle, display of the relative proportions in the dimensions of the passage, the chamber, and the cairn packing, obtaining required area with the available sizes of the stone slabs by contriving various types of plans, setting up pillars to support multiple capstones, constructions of the coursed walls, at once indicate the practical skill and simple arithmetical knowledge of

2 *bIid.*, p. 218.

structural engineering."[3]

Sundara also found that different kinds of stones, according to their natural forms and appearances, were used for specific parts of the megaliths. While riverworn pebbes and quartzite sandstone rubble were utilized for raising cairns, every kind of stone was neatly dressed, but only where the builders thought it necessary. This was rarely on the visible side. Orthostats were invariably left undressed. Hence Sundara feels that "the dressing was perhaps a part of the ritual", and not a necessary architectural or decorative feature.

These are very far-reaching conclusions, and in the present state of our knowledge, seem to be a special feature of the Karnataka megaliths. But looking to the importance of this conclusion, it should be more broadbased, and its survival or otherwise should be tested ethnographically.

Though we still do not know about the houses and habitations of these megalith-builders, the recovery of sickles and plough coulters, and of rice and ragi grains from the excavations at Kunnattur and Hallur respectively, shows that these people were probably dependent largely upon agriculture and partly upon hunting, as proved by the hunting scenes in the rock-paintings at Hire-Benkal. This hunting was probably undertaken on horse-back, wherein again a part of the community participated. Animals such as cow/ox, goats/sheep, dogs and horses were domesticated. This picture of an agricultural-cum-hunting society would be incomplete, if we do not take note of their love of, or interest in, gold and iron for use as ornaments and tools respectively.

Though the megalithic sites seem to be concentrated near rocks bearing these minerals, it remains to be proved still whether these people quarried these rocks or collected these from laterite and other blocks or iron-bearing rocks, and got gold from river-sand. Anyway, there is little doubt that they had mastered the art of smelting and casting, so much so that they could afford to bury both the iron tools and weapons—as well as gold ornaments in their graves.

So far no evidence of literacy in the form of writing of any kind has been found from the megaliths in Karnataka (or anywhere else), yet it is possible that the megalithic people in Karnataka or South India were literate in a small way. For, otherwise there was no reason why Asoka should have planted his edicts at several places—now at least three—in Andhra-Karnataka border.

Habitations

Though so far we have no positive idea of the nature of their houses, nevertheless, if we are to judge from the large and varied nature of pots and pans—bowls of various sizes, dishes, dishes-on-stand, vases, all in fine polished thick black or black-and red surface, and the usual basins and jars,—and, of course, fabrics, we shall have to say that these people not only were not nomads and simple pastoralists, but a people with a well-developed standard of life in which varied food preparations—both dry and liquid—must have played a regular part.

Though no ethnographic-ethnological survey has been undertaken to ascertain how

3 Sundara, *op. cit.*

many and what types of pots and pans the primitives and semi-literate in South India normally possessed, such a survey, if undertaken, will surely reveal a comparative degree of sophistication the megalithic people had attained, some 2500-2700 years ago, in a large belt of India stretching from Nagpur in the north to Kanyakumari in the south.

While the beads and bangles of various materials, including gold, do suggest the people's love of personal decoration, the occurrence of necklace of conch shells not only shows contact with the sea through trade or acual migration of people, but also presupposes some religions custom in society. This is so peculiar that its traces or survival in the present society should be searched for. The person in whose grave these perforated shells were found might be the head of a religious order. It would be interesting to find out if such an order exists today.

Finally, on the question of the identity of the megalith builders, Sundara[4] has shown how there was mutual borrowing between the Neolithic-Chalcolithic inhabitants of Karnataka and the megalith-builders who arrived about 800-700 B.C. As Kennedy has said, it is difficult to say anything about the racial types from the study of the extant skeleton remains.

Hence the only thing left to a culture-historian are cultural relics. Amongst these the only significant thing was the port-holed cist, the likely significance of which was discussed long ago by Gordon Childe. Now Sundara says that of all the megalith-chamber types of tombs of North Karnataka, nay South India, it is the passage chamber that has fundamental resemblances with that of the Mediterranean and Western Europe. He further thinks that the South Indian megalithism was derived from the Mediterranean region *via* the coastal route. How this could have happened has been discussed by Gururaja Rao, Sundara, and others; beyond this we cannot go at present.

Coorg

Some idea of the megalith in Coorg can be had from the work of K.K. Subbayya.[5] Excavations of three or four megalithic site at Heggadehalli revealed some new types of burials, which seem to be unique. Instead of the stone sides containing a simple pit or an underground cist of stone slabs, at this place, the sides contained a pit and at the base of the pit was laid a granitic slab over which the funerary offerings were deposited. The pit was then filled with soft earth. On this lay the large capstone.

Another Megalith contained only a pit without a stone slab at the base, whereas in the third one was a cairn side, under which was a stone chamber of large granitic slabs, inordinatly large in dimension. It also contained an underground passage to the east outside the cist.

Except pottery, nothing else was found. This is of the usual kind, black-and-red,

4 Sundara, *op. cit.*; pl. XXVII illustrates no less than. 21 conch shells from disturbed Round Barrow at Tallur, Bijapur District.

5 *Archaeology of Coorg with special reference to Megaliths*, Ph.D. thesis, Poona University and Deccan College Library, 1972 (Unpublished).

and included bowls, tall three-legged vases and conical vessels. What exactly was the function of the last two types of vessels we shall know only when a habitation site is *excavated contextually*.

Uptill now, we may note the total absence of weapons of any kind, and also that of any items of personal decoration like bangles or beads of cornelian etc. However, the differences in the method of making these three megaliths might indicate the kind of economic and social status their builders enjoyed in their society. The three or four types of pots were a "must". These with the food and drink placed in them, all the dead must have.

Vidarbha

Not only the prophecy about the regional variation has been fulfilled, but a welcome extension of the South Indian megaliths to Vidarbha has come to light by the excavation at Junapani[6] and subsequent full-fledged excavations by the Nagpur Uuiversity at Khapa[7] and Mahurjhari.[8] This season's excavation[9] at Naikund, 40 km. north-east of Nagpur, has further revealed the existence of a habitation site, which, as I have said so often[10] had never been searched for.

The current excavations, as the earlier ones at Khapa and Mahurjhari, and those undertaken by Deo and Jamkhedhar at Naikund have supported my suggestion that the megaliths should belong to a particular section of the community or people in each region. The evidence from Vidarbha and Tamil Nadu, particularly horse bits and several types of iron weapons suggest that these sepulchral monuments might only belong to a warrior class. This would be apparent from a more detailed discussion.

Khapa

At Khapa, situated on the left bank of the river Krishna (a small river in district Nagpur) there are a number of megaliths in the form of stone circles, whereas on the opposite site at Takelghat there is a habitation site. Both were dug in 1968-69 by Nagpur University. Out of the nine megaliths, Megalith I which was the largest of all having a diameter about 25-26 metres, yielded interesting evidence. On the black clay surface were placed pots and pans of black-and-red were, micaceous Red Ware, and coarse Red ware; objects-tools, utensils, and weapons of iron and copper, copper bangles and beads of carnelian and bones, possibly of the horse. In the Megalith was a large copper ornament to be tied over the face of a horse. This is rivetted at the back with iron pins.

Among other interesting objects must be mentioned the copper dish and a copper lid each with a bird motif, the copper bell and a chain of copper rings, having certainly

6 *IAR.*, 1961-62, pp. 32-34.
7 Deo, S.B., *Excavations at Takalghat and Khapa* (1968-69).
8 Deo, S.B., *Mahurjhari Excavation*, 1970-72.
9 Deo, S.B., and Jamkhedkar, A.P., carried out this excavation in Feb.-March 78.
10 *Prehistory of India*, p. 151.

had formed a part of horse's equipment (probably strung round the neck, as some tongawales who took pride in their tonga and the horse, used to do some 30-40 years ago. I have myself seen and sat in such well-maintained tongas).

The excavation of the habitation site on the opposite side at Takalghat gave some idea of the houses these people lived in. In the two earlier phases the floors were well made with rammed brown clay, and coated with lime, whereas the walls were made of mud, with supports of wood/bamboo posts.

Interestingly, the house remains of Phases A and B yielded painted pottery, besides, of course, other wares, such as, beads, iron and copper, and animal bones. Should we, therefore, think, for a moment, that the burials at Khapa, since they do not have a trace of painted pottery, do not belong to the inhabitants of such houses, or that they are of a race who were either socially, ethnically or culturally slightly different, though belonging to the same period ? This, at present on the evidence of C—14 date from Takalghat, is placed around 556 B.C. However, this may be taken back a century or two, because Takalghat Megalithic Culture is believed to be similar to that of Hallur in Karnataka. Here Period II shows the overlap of the Megalithic with the preceding Neolithic, and has a date of C. 900 B.C.[11] Hence it is suggested that the Khapa—Takalghat Megalithic culture might be a century or two later, that is C. 700 B.C.

Mahurjhari

Compared to Khapa Mahurjhari, about 20 km. to the north from Nagpur on the Nagpur-Kalol road, is a megalithic haven. With Junapani, it is said to have more than 300 Stone Circles. Some part of the region is hilly, while the rest is dead flat. And surprisingly the Stone Circles are found in both, while it would be comparatively easy to erect these stone circles in the former, it would be difficult in the latter. However, as at Khapa, no habitational site seems to have been located nearby.

In Locality I, Megaliths 2 and 3 yielded iron axes, daggers, copper bowls, bells, bangles, numerous beads of semi-precious stones, black-and-red pottery and even gold leaves.

In Locality II, the Megalith[12] gave several copper bangles, iron axes, chisels, gold spiral, iron-nail and pairers but no bead.

Megalith 3 seems to be more important, as it gave a human skeleton with so many objects, placed near the various parts of the body (*fig*. 5, pl. IX) and the second one to yield painted black-on-red sherds.

Megalith 4 was interesting, as it yielded numerous antiquities, such as copper decoration for the horse, and gold ornaments with punched decoration, and pottery lids with the goat and bird motifs, besides the usual iron and copper objects.

Megalith 6 yielded a carefully interred human skeleton with gold necklaces (*fig*. 6. pl. X). Such a rich equipment was also noticed in Megaliths 8 and 9, both having two burials.

11 Deo, *op. cit.*, p. 13.
12 Deo, *op. cit.*, p. 3.

From the detailed analysis of Megaliths in all the three localities, and their summary by Dr. Deo, it can be said that Locality III, with its full-length human skeletons, and rich in objects of iron and copper, including those for the horse, gold ornaments and painted pottery belonged to a family or persons who were rich and important—probably warriors of a high status. While the painted black-on-red pottery is said to be similar to that found at Paunar, Takalghat and Khapa (really Takalghat only, because here alone such pottery was found and not in the burials at Khapa.)

The rest of the pottery was predominantly micaceous. And this might have some significance, as Dr. Deo notes, because at Adichanallur, fragments of mica were found. Generally, such ware is confined to large storage jars, having a flared mouth.

Megaliths : Poona

It is interesting to note that compared to the South Indian megaliths, and even the smaller Vidarbha, those in the Poona district look poor. These might be just memorial structures or poor copies of true megaliths. This is suggested by their external appearance, for instance, at Pimpalsuti, Taluka Shirur, and at Theur, near Poona.[12]

Megalith-like monuments had already been reported near Poona in the last century. They, when re-examined in 1940-41, turned out to be memorials to the dead, but not funerary in nature. However, the late Prof. Kosambi and after him Prof. Gaur have re-opened the subject[13], and think that these are megaliths, but without pottery, and any dateable objects. The occurrence of so-called early microliths, has nothing to do with these monuments. Just before Kosambi's death, we had seen all these monuments in his company. Further, as he had desired, we carefully examined the so-called rock-engravings—particularly cup marks and concentric circles.

This study by geologists, geomorphologists, chemists, and archaeologists proved that 99% of the so-called engravings were natural.

The same is the case with the so-called "early microliths". All these are chips of quartz and agate which occur occasionally in the trap rock. When a fragment or a chip of quartz or agate loses the other roundish granules, a roundish hole appears, Kosambi in his omniscience regarded this as a "bored microlith." The question is, "How, with what tool, the prehistoric man would bore a hole in such a hard, intractable rock as quartz ?"

U.P. Megalithis

A new dimension to the megalithic problem in India has been given by the discovery of megaliths in the districts of Banda, Allahabad, Mirzapur and Varanasi by the Universities of Allahabad and Banaras. These four districts lie in south-eastern Uttar Pradesh.

12a Dhavalikar, M.K. and Ansari 2, D.'Cyclopean Structures near Poona' *BDCRI*, 1975, vol.xxxiv, pp.
13 Gaur, R.C., "The Early Megaliths in Poona and its Neighbourhood", *D.D. Kosambi Commemoration Volume*, ed. by Lallanji Gopal, Varanasi, 1977, pp. 15-23.

The monuments called as cairns and cists are comparatively sparsely distributed either near the junction of the northest slope of the Vindhyas, and the Ganga plains or in the river valleys enclosed by the hillocks or on the plateau of the Vindhyas flanked by Vindhyachal in the north and the upper Rewa Ranges in the south, in different altitudes and settings.

The east-west dimension of this region is about 320 km. Owing to this vast expanse naturally there are differences in the materials used for constructing the structures. All the same what they all have in common is the fact that in all the excavated examples in Varanasi, Allahabad, Mirzapur and Banda, their makers had dug fairly deep pits even in hard ground, and covered the funerary deposit which though varying in other essentials had a Black and Red ware (as in Vidarbha and the south) with a hemispherical cairn of boulders bounded by stone circles. For preparing a cist, a similar pit was dug and a box-like chamber was prepared with orthostats and secondary packing of small stones, and covered with a massive monolithic stone slab resting directly on the four uprights. These Chakia-Varanasi cists are often built with small stones and without a port-hole, and rising just above the ground.

Authors

Who could be the authors of this pre-Iron Age megalithic culture, having some affinity with the Chalcolithic people of Central India in the west, and the Neolithic in the east ?

Interestingly, unlike in the south, the Allahabad megaliths reflect the change that had come over the whole of India. The basic types—cairns, circles, and cists—remain the same, but among the grave goods, occur, instead of microliths, iron objects—sickle, adze, arrow-head and dagger.

Thus, there is a significant variation in the means by which the inhabitants of the two cultures eked out their life in war and peace. Iron had replaced stone and copper and, as the evidence from Kotia and similar sites in Allahabad shows, these were made locally. Even the pottery from Kotia and several sites in eastern U.P. is said to be quite different from its counterpart of Kakoria on the Chandraprabha. A C14 date of 2200+105 B.C.(?) gives some indication of the time range of this Iron-age megalithic culture.

Two megalithic cultures intermediary in date between the Chalcolithic Cultures of Varanasi and the Kotia culture of Allahabad have been found at Koldihwa—Deoghat and at Khajuri, on the opposite bank of the Belan. In the former iron is absent, and microliths few, while in the latter fragments of iron are associated with microliths.

These three different kinds of megalithic cultures have also been observed in Mirzapur and Banda districts.

There is no doubt that the Universities of Banaras and Allahabad, particularly the latter, have opened up a very tantalizing picture of man and his activities—contacts and movements—between say, 1500—200 B.C. These areas are even now sparsely populated, and the home of Adivasis like the Mundas, Gonds, Bhils, etc.

An ethno-archaeological survey of the region might reveal whether the traces of these "advanced cultures" might be accounted for by the overflow or movements of

people bearing a higher culture across India from south to north and east to west or vice-versa.

One thing is very enigmatic that in spite of these local variations, the inhabitants used, right from the beginning up to the end, a Black-and-Red Ware,[14] probably with the same types of vessels. That is for nearly 1500 years neither the technique of potting, dressing and firing changed, but the way of life at home remained the same. This conservatism is nothing strange for a country like India. But why so much fascination for a Black-and-Red Ware ? Was there no change in the technique of manufacture and in the shapes ? Is it not high time that the scholars at Banaras and Allahabad should probe these questions scientifically ? As it is, we do not have even a corpus of pottery from these four districts. This is a basic desideratum.

Megaliths : Kashmir (See Fig. 25)

Megaliths have been discovered at Waztal, about 12 kms. from the Matau Spring, and Brah, about 9.6. kms. from Martand.[15] At both the sites a number of huge standing stones were found. But they lie so scattered, not in any regular plan. As at Burzahom a few sherds of gritty red ware were also collected.

Authors

With regard to the authorship of the megaliths, there is no unanimity of opinion. Dr. L.S. Leshnik[16] employing a South Indian term, viz., *Pandukal*, and describing megalithic burials as Pandukal complexes, re-examined in detail the old evidence from Junapani and Kampti by Rivett—Carnac. He compared this testimony with that from Sanchi and Taxila, Iran and sites from the Caspian Sea, and drew some broad conclusions. These have been briefly cited here.

Rivett-Carnac had assumed that the cists and simple burials were the interment of the dead from amongst the same people, adjusting to local conditions. Wherever possible, cists were built; otherwise, in trap regions, pits were dug. In some cases, ash or sand, red soil or black soil—that is, all manner of indigeneous materials were used in the graves. This custom is reminiscent of a custom in eastern Persia (Geiger, *Civilization of Eastern Iranians, 1885*) and supposed to be an *Avestan* prescription.

The most interesting objects from a comparative point of view are a long spear—head and a bow—shaped buckle with a moveable tongue. This is said to be a Central Asian innovation, first appearing in the 3rd century B.C. There the common shape of the buckle was round, like a ring, or square. This seems to have been made bow-shaped in India, Another object is a well-preserved iron snaffle-bit (*Fig*. 35, pl. 8a). This is compared with a similar object is a well-preserved iron snaffle-bit (*fig*. 25, pl. 8a). Thls is compared with a similar object from the Parthian levels at Taxila. Again, the iron celt (or axe-head) is of the old primitive type,

14 Misra and Misra, *op. cit*., pp. 312, 313, 315, 318, 319.
15 *IAR*, 1969-70, p. 13, pl. XXII, B, XXIII, A pl. XXIII A, Waztal.
16 *Man*, 1970, pp. 499; *JASB*; 1879, pp. 1-16, and *IAR*; 1961-92 (1964), pp. 32-4.

without a socket, and the bell with a single jingle is said to be native to Central Asia.

A dagger with a curved blade and ladle with a long vertical handle—also called spoon lamp—are compared with similar objects on Indo—Scythian coins and Parthian Taxila.

Again, the plough-shares from Yelleshwaram, and Junapani are shown to be advanced agricultural implements, (*fig*. 37, pl. 8d).

Notable is also a plaque from Khapa and Mahurjhari, with outstretched arms, adorned on the surface with bosses. This, as in the West Caspian site of Djonii, near Linkorn adorned either a garment or a saddle.

Equally important is the occurrence of shaft-hole axes, used now by farmers for chopping small bushes, but used then as weapons. (See Fig. 23-24)

After a detailed consideration of these few characteristic objects found from the *Pandukal* complex near Nagpur, Leshnik observes, "Suffice it to say that all the burial modes included in the Pandukal complex can be referred to the general area of the Caspian Sea and the Iranian plateau. The so-called catacomb graves, port-holed cists, bath-tub shaped terracotta sarcophagi,etc., which are characteristically Pandukal, date a period which conforms with the occurence of similar burials in the west. The Nagpur evidence allows an estimate centering about the first few centuries B.C., and this should be slightly earlier than the southern Pandukal sites."[17]

Leshnik goes further and ascribes nomadic habits to these people who had entered India with the Sakas and Kushanas through Sind and Baluchistan. He would further identify the land which this people occupied as *Aruvalar* of the Tamil literature. According to Aiyangar (1941, p. 544), cited by him, these people are called specifically the "people of the bill-hook."

He further thinks that these nomads followed the established route, agreeing with the suggestion of Allchin that the Neolithic culture of the south is non-Indian in origin.

Whatever the exact origin of these megalithic graves, there is little doubt that these people were (the earliest ?) horse-riders and warriors, some of them having been farmers as well. And though nomadic (originally?), they had some sort of settled life, as has got to be inferred from several types of bowls and dishes, though so far no large storage vessels have been noticed in their graves. That these people were some sort of agriculturists has also been conceded, because of the presence of hoes/plough-shares in their grave furniture. But it is pointed out that nomadic pastorality and agriculture were a combined practice once upon a time in Iran and Central Asia. Also present in Hyderabad graves were triangular, four-sided and round arrow-heads. (Taylor, 1870, and Leshnik, *p*. 510).

Though the views of physical anthropologists like Dr. Kennedy might act as a deterrent to drawing any inferences about the movement of people from the north to the south or *vice versa*, particularly at a period, when these huge stone structures appear, still, archaeologists continue to find evidence which would support this or that view.

17 Leshnik, *op. cit*., p. 509.

The presence of so many weapons—swords, spears, daggers and bones—and horse bits as well as horse suggests that these people should have belonged to a warrior class These warriors were not quite nomads, as their graves contain a good deal of pottery. These or some of this must have been used for cooking and storing in every-day life. Though small vessels with ornamental finials, might be for occasional use, nonetheless these do pre-suppose some settled way of life.

These people whether nomads or settled, both in U.P. and Vidarbha, used ornaments—finger-rings,[18] large and small ear-rings,[19] long earments[20] with spirals and necklaces of bi-conical beads.[21] Some of these, like circular pieces of gold leaf, were further decorated.[22]

All these were not of pure gold. The analysis by Shri N.M. Nasnolkar shows that though all contained a fair amount of silver. its percentage varied from 90, 50 to 25. Is this alloying natural or intentional ? It could be the former, if these Vaidarbhis did not know the art of separating alloys.

Depending upon the report of the physical anthropologist who examined the Khapa and Mahurjhari[23] human skeletal remains, it is thought that the stains on teeth imply tobacco consumption in either masticatory or fumigatory fashion. This seems to be a conclusion of far-reaching importance. One wonders if tobacco was known—even in a wild form, at so early a date, either in India or in South America, whence it is believed to have been brought and introduced first in Europe only in the 16th century ![24]

Compared to the Vidarbha megalithic people, those in U.P. seem to be poor, for their graves did not contain so many weapons, and only occasionly a gold ring or bangle[25] was found.

However, this might be just a regional or sub-regional variation, due to the existence of varying statuses of the megalithic people themselves. For even in Vidarbha, all the earlier excavations at Junapani, Kaundinyapura, Khapa and Takalghat did not yield any gold ornaments, though there was a trace of painted pottery.[26]

So far the most recurring feature is the presence of so many iron weapons, horse bits along with bones and lids with bird or animal motif.[27]

Deo has already commented on the existence of an identical feature on the lid from the century-old excavation at Adichanallur. Could this be accidental ? Or, does this imply a kind of culture contact which we cannot define at present ?

18 *Mahurjhari Excavations*, pp. 78-79.
19 *Ibid.*, pl. XXVIII, i.
20 *Ibid.*, pl. XXVIII, 2.
21 *Ibid.*, pl. XXVIII, 1.
22 *Ibid.*, pl. XXIX, 5.
23 *Ibid.*, pp. 73 and 75; *Khapa*, p. 77.
24 According to the current knowledge as summarised by Shri M.D. Kajale, of the Deccan College
25 *Kosambi Commemoration Volume*, p. 312.
26 Deo, *Excavations at Takalghat and Khapa* pp. 56-59.
27 *Ibid.*, pl. XVI; *Mahurjhari*, pl. V.

While the question of date of the megaliths cannot be easily settled, well-organised attempt should be made to understand the political, social and economic background of the megalith-builders, be it in Vidarbha, Andhra, Karnataka or Tamilnadu. It seem almost certain that no ordinary family or group could think of erecting such class. huge, overground and partly overground huge stone, after-death, structures. Some light on this problem might be thrown if a group of megaliths in a particular region is excavated as well as attention is concentrated on the search for habitation sites.

Astronomical Significance

A scientist-archaeologist like Prof. Thom might also measure a group and ascertain whether these, as in England, had astronomical significance.

PART III

Historical Archaeology

Numismatics

During the last 15 years few startling discoveries have been made in this source of Indian history and culture, though, as usual, there have been reports of this or that hoard, found in a pot, buried in the ground, or just in the river bed!

Coins and Stratigraphy

However, neither the students of numismatics or other scholars have yet realized the impact of stratigraphical excavations in this subject.

No doubt, we generally prefer coins to any thing else for dating an excavated deposit. But it is forgotten that in India, most of our knowledge of various categories of coins—Punch-marked, Cast, Tribal, and then Dynastic, such as Andhra (Satavahana), Gupta, etc., was based on the topographical collection and classification by savants like Cunningham, Rapson and Elliot, followed by Allan, P. Gupta and others. While we must admire the great vision these pioneers have shown in their study, particularly in formulating chronologies of various Dynastic Houses as well as the successions of various rulers, *inter see*, we should not forget that all these needed confirmation from literature and archaeological excavations. While the former was sought in the various Puranic accounts of dynasties, the archaeologieal proof is now being supplied by excavations from different parts of India. These, along with characteristic pottery fabrics, should now be made the basis of studies in our Universities. Naturally, we should have a well-illustrated corpus of all such discoveries.

By way of illustration, I may mention the very recent excavations at Sanghol and

Delhi, Tumain and Tripuri in M.P., Pauni in Vidarbha[1], and Kaveripattinum in Ta.nilnadu and the latest at Sonkh, near Mathura in U.P. For the earlier excavations; I would cite my articles in the *Journal of the Numismatic Society*, as well as our reports on the *Excavation at Maheshwar and Nevasa* respectively.

At Tumain, M.P., no coins were found in deposits of Period I (c,400-100 B.C.), whereas Punch-marked and Inscribed Tribal coins were noticed in Period II (200 B.C.-400 A.D).[2] Likewise at Jadura, District Gwalior, M.P., no coins were associated with Period I and II A. In these were found respectively the Grey Ware and the Northern Black Polished ware.

However, square copper coins bearing Tree—in—railing and Crescent-on-Hill symbols, and later Naga coins were found in Period II B.[3]

Perhaps the best instance would be that of the Bodhis. Only a few coins of this dynasty were known. From their nature it was placed somewhere in Western India, and dated on palaeographical grounds to c. 150 A.D., that is contemporary of the Western Ksatrapas and Satvahanas.

Now excavations at Tripuri, M.P., during the last decade, have yielded a number of coins as well as baked sealings of five rulers. There are: 1. Sri Bodhi, 2. Chandra Bodhi, 3. Vasu Bodhi, 4. Siva Bodhi and 5. Dharma Bodhi.

Since these things were found in a layer above that of the late Satavahana, the Bodhi occupation at Tripuri has been dated back to 200 B.C.-300 A.D.

It is also now held that the suffix or the name-ending "Bodhi," does not suggest that the rulers were Buddhists. For, no tangible evidence was found in the excavations.[4] This is also indicated by the first part of the name. However, on this point, we wish the excavators to publish all the details. For, according to the *Liṅga Purana*, some of the early rulers of Tripuri were Buddhist.[5]

The stratified evidence from Sonkh.[6] Mathura, where a large excavation was conducted should also be important. In fact, with this stratified evidence, numismatists should take up the question whether the Tribal coins—the earliest—show any foreign influence, as do the later ones.[7] This can be easily proved, if the Die-struck coins are found in pre-Indo-Greek deposits, as these were supposed to be at Taxila. Such vital questions should now be decided by more positive and widespread evidence.

Numismatists as well as historians have never thought what the position of these so-called Tribal kingdoms was under or with the foregin rulers—Indo—Greeks, Parthians, Sakas and Kushanas- Were some of them not foreign in origin ? These tribes seem to spring up suddenly on the political map of Northern India, between 200 B.C.-400 A.D., as indicated by coins. Very few of them are referred to in the epics—none

1 *I.A.R.*, 1968-69, p. 16.
2 *I.A.R.*, 1971-72, pp. 28.
3 *Ibid.*, p. 29.
4 Bajpai, K.D., "Coins and Sealings of the Bodhi Dynasty of Tripuri" *JNSI.*, XXXVII, 1975, pp. 31-38, also.
5 Shastri, A.M., "Fresh Light on the Bodhi", *JNSI*, XXXIV, pp, 213-22.
6 *IAR.*, 1968-69, p. 40.
7 Srivastava, G.M., in *Seminar Papers on Tribal Coins of Ancient India*, Ed. Singh, I.P, and Ahmad Nisar, 1977, p. 145.

by the *Ramayana*. It is also worth investigation what the relation of these tribes was with the earlier Aryan and Epic tribes.

Sonkh

It is too early to comment on the epigraphical significance of the occurrence of the coins of various rulers at Sonkh. For we have not got all the data. But Dr. Hartel[8] has already said categorically that at Sonkh there was both numismatic and other evidence to place Kaniṣka I in the first century A.D. and there would be no justification in placing him later!

Thus, we have archaeological proof in support of the most accepted date of Kaniska I as 78 A.D.

It is for numismatics now to re examine their old data as well as study the new evidence from a few well-stratified excavations in U.P., Haryana and Punjab.

The excavations at Purana Quila, Delhi should be considered very significant. Here in the first seasons's excavation (1969-70), the earlier deposit reached was Mauryan. This yielded only cast copper coins. The next (Suṅga) did not yield any coin, but the next Saka-Kushan gave copper coins of Mathura kings, as well as of the Kushans and and Yaudheyas. These were also found in the next season,[10] which gave in the subsequent layer a gold-plated Gupta coin. The Pauni sequence[11]-Punch-marked, Satavahana, Kshatrapa-seems to support the generally accepted views, but the first might be a late survival. The evidence from Tripuri[12] appears excellent, but should now be studied more critically.

Important Discoveries

Among the stray discoveries, the one, unearthing of silver coin with the legend of Isvaradatta,[13] and the mention of the year "154" and other details—facial features, head-dress, etc., strongly suggest that these coins are of the Ābhira raja Isvarasena. If this can be established by further evidence, then a very important gap in the chronology of the Ksatrapa-Ābhira relations may by said to have been filled up.

The Ranjangaon Hoard of 1519 Kshatrapa coins is important, not because it offers a few new dates for Ksatrapa rulers, but as the author[14] has pointed out, these coins being in silver, were used as bullion and circulated in the Satavahana region[15].

Interesting is also Gokhale's discovery of the rare portrait coins of Satavahana rulers, Vasisṭhiputra Pulumayi, Skanda Satakarni, and Gautamiputra Satakarni. The

8 Hartal, *op. cit.*, p. 85.
9 *IAR*, 1969-70, pp. 4-5, pl. XII.
10 *Ibid.*, 1970-71, p. 10, pl. XXVII B.
11 *Ibid.*, 1968-69, p. 16.
12 *Ibid.*, p. 12.
13 Gokhale, Shobhana, in *Marathwada Research Mandal Annual*, 1976, pp. 94-97.
14 Gokhale , Shobhana, *JNSI*. XXXVIV, 1976, p. 29.
15 From the unpublished Ms.

stray occurrence of coins does not necessarily show that its issuers really ruled in that region.

For the history of the Elephanta Cave, particularly its Trimurti Cave, Gokhale's identification of copper coins from Elephanta as those of Kaṭacchuri Krishnarāja, along with Spink's earlier attribution is important.

However, of all the stray finds the silver coins of Sātakarṇi and Nāganikā must be regarded as most important, Not only the metal and the unique combination of names but the provenance-Junnar, 48 miles north of Pune—helps to remove the doubts about the position of Nāganikā (or Nayanikā). The legend *Ramno Siri Sāta* makes it absolutely clear that Nāganikā was the wife of Siri Sātakarṇi, the third in the Puranic list,[16] and not the mother of the Sātakarṇi, as thought by some earlier scholars. Secondly, as shown by Chinmulgund, we can also now understand why the long inscription at Nanaghat mentions the various sacrifices they performed together, and why the relief figures and inscriptions emphasize this fact. In fact, this coin is another solitary relic which proves the practice of the performance of the Vedic sacrifics by the husband and wife together—a practice which Rama had followed, and in the absence of Sita, had placed a golden image of hers side by side when he performed the Aśvamedha.

It was in commemoration of this event that the coin was issued by the king and the queen.

For nearly three hundred years, and possibly more—this practice which endowed an equal status to the wife survived. We can now affirm that it was not revived by the Guptas; but the practice was continuing, inspite of the headway that non-vedic religions like Buddhism were making.

A vigorous search in and around Junnar might bring to light a few more coins of this nature.

Analytical Study of Coins

Attention may also be drawn to the analytical study of coins. This kind of study was not attempted earlier. It is now doubly important. First, it tells us the method or techniques employed in minting in ancient India; secondly, the nature of the alloy has an important bearing on the economic conditions of the time, or that particular region.

Hence, we find that the gold and silver metals intended for coinage, were strengthened by alloying with them 8 to 10% of copper or bronze. Following this method, the Ksatrapa coins are said to have contained as much as 18% of copper. This is far more than required for strengthening the metal.[17] Hence, this is symptomatic of the economic difficulties of the time. What exactly they were we cannot say.

16 Chinmulgund, P.J., "A Unique Silver Coin of Sātakarni and Nāganikā", *JNSI*, XXXVIII, 1976, p. 8.

17 Hegde, K.T.M., "Chemical and Spectrometric Studies in Ksatrapa Silver Coins", *JNSI.*, 1967, pp. 63-66.

Similar alloying—and this time with 20% of iron—from Paunar, Vidarbha may be indicative of the paucity of copper in the region.[18]

We should have more of such studies from several sites. Then only a many-angled economic history of Ancient India can be had.

Origin of Coinage

Finally, about the origin of the coinage in India. How far are we nearer the answer? It was clear that the literary evidence which scholars like D.R. Bhandarkar and A.S. Altekar had discussed in detail was not of much help. "While there was no doubt that lumps of gold, called *niṣka* and *suvarṇa*. probably of fixed shape and weight, were known and used in the Vedic period, none of them bore any stamp of the issuing authority. Hence, these cannot be regarded as minted money."

Under the circumstances, it was apparent that some definite archaeological evidence was necessary. Fortunately this has now become available. This has been discussed in an article by Dr. M.K. Dhavalikar.[19] The evidence is not from India proper, but Iran and Afghanistan. And interestingly the evidence from Iran shows that like the hypothetical gold lumps as in India, the earliest ingots of silver were unstamped. These bear a striking resemblance, as Bivar[20] and Dhavalikar have pointed out, to the silver bent bars which had been known much earlier and discussed by numismatists like Allan and Walsh. Such bent unstamped silver bars were found earlier in Afghanistan and dated to about 380 B.C.

The transition from the unstamped variety to the stamped variety seems to have taken place soon after. For in another hoard in Afghanistan out of the 22 bent silver bars, two bars bear the characteristic six-armed symbol or wheel, thus we have clear evidence of silver bars in Iran without any symbols, and bars from Afghanistan with and without symbols.

Thus, there is no doubt that the original inspiration and the practice of using silver bars is Iranian. It was introduced probably by the Achaemenians, first in their eastern provinces, and since these remained in their occupation for nearly 200 years (c. 556 B.C.-331 B.C.), the use of silver bar, straight or bent, was adopted.

When the Indians come into contact with the Iranians, they adopted these bars, but they went further and began to stamp them with six-armed symbol. However, finding the use of bars impracticable these were cut into pieces. Thus, were born the "Punch-marked" coins. Many of them are of silver, as their progenitors, but some are of copper as well.

Thus, in our present knowledge the Punch-marked silver coins, which were hitherto regarded as the earliest Indian coinage, have been proved to be so, but with their parentage clearly indicated. As the C-14 dates from several sites show, these coins

18 Hegde, K.T.M., "Analytical Study of Paunar Coins," *JNSI.*, 1975, p. 183.

19 Dhavalikar, M.K., "The beginning of coinage in India", *World Archaeology*, Vol. 6, 1975, pp. 330-380.

20 Bivar, A.D., "A hoard of ingot currency of the Median period from Nush-i-jan". *Iran*, Vol. 9, 1971, pp. 97-111.

and the associated Northern Black Polished Ware cannot be placed earlier than the 4th—5th century B.C., even in Punjab, and U.P.

Epigraphy

Though a number of inscriptions, inscribed on stone, copperplate and terracotta plaques continue to be discovered in a vast country like India, with a long, rich and varied historic past, all the same some of these records are of unusual historical or cultural importance.

Thus, only three years ago an inscription in early Brāhmī characters was found engraved on a rock on the top of a sandstone hillock or range of Vindhyan hills near Bhopal. Careful investigation by a young assistant in the Archaeological Survey of India (ASI) and his enthusiatic colleagues not only traced the remains of several *stupas*, made just with naturally flaked sandstone slabs, and rock-cut *vihāras*.

Besides these rubble-made stupas, was found an inscribed relic of the 2nd century B,C. More important were two Asokan edicts. Though these rank among the Minor Edicts, they supply some new information. In the first place the edicts make specific mention of the emperor's name as "*Priyadarsi nāma Rājā*". "Asoka" was his assumed name. (See Figs. 27-28)

Further the edict also mentions the name of a son of Asoka, called Kumāra Sāmba, and also refers to a *Vihāra* named Upalisa. This probably was the name of the Buddhist establishment on the hill.[21] Its another antique feature from my point of view was its ecological character. The various *stupas* and *viharas* were made with just naturally available sandstone slabs. It is an excellent evidence of dry architecture.

Pale Inscription

Of single importance for the history of Jainism in Maharashtra, as well as for the testimony of the likely existence of still unknown group of caves, with an inscription in early Brāhmī letters, is the discovery near Pale, a village near Kamshet, in the Poona district. Since the discovery is fully reported and commented on,[22] only the salient features are here mentioned. (See Fig. 32)

In a new (or hitherto unknown) V-shaped valley, near Pale village, an inscription was found in a single cave with a water cistern. It is carved in early Brahmi characters of the 1st -2nd century B.C. with an invocation (*maṅgalācharana*) to Arhat. It has been shown by a detailed review of all the evidence that this—Arhat—was specifically reserved for a Jain Tīrthaṅkara. Thus Pale supplies us undoubted proof of the prevalence of Jainism, exactly at the time when Buddhism had reached the region. Secondly, it gives us hope that with more diligent search in this hilly, forested region more caves of this nature might be found.

21 *Archaeological News* (Madras), Vol. I, No. 4, July 1978.

22 Sankalia, H.D., "Early Epigraphical evidence of Jainism in Maharashtra," *Prachya Pratibha*, Vol. III, pp. 1-9.

Hero Stones

Even for a late period, the brief Pallava and Chola records, often inscribed on hero stones, are of great general interest. These show that what the Kauravas did during the Mahabharata times, viz., raid the territory of king Virāta (present Bairat in Rajasthan) and carring away large herds of cows, was a regular method of enriching oneself even during the historical period. For, cattle and grain, and not so much the minted money, were the main sources of wealth as well as the modes of exchange. We are also told that watch-dogs were kept in buffalo-sheds, and how Koravan, a dog, bit a cattle-robber. If during these cattle raids, the defenders died then hero stones, called Pāliyas, were erected in their memory.

This nuisance, or anti-social activity continued even during the subsequent Chola rule. Thus these few published inscriptions supply us the history of cattle raids for more than four centuries, 6th-10th century A.D.[23]

However, what I cannot understand is that at this period, farmers and others kept herds of buffaloes, and not of cows. For, our general belief is that until very recently-say 50 or 100 years ago—people all over India, and particularly in Tamil Nadu used cow's milk for drinking, making curds and ghee as well. But these records indicate that buffalo-milk was used, unless these cattle were kept more for their meat rather than milk! Hence these hero stone inscriptions from North Arcot District are of unusual sociological significance.

Interestingly it is one of these cattle-keeper (or watcher or protector) who, according to a recent discovery of a memorial stone (*Polia*) was immortalised into Shri Vitthala at Pandharpur.[24]

Bilingual Records

Another inscription from Thanjavur (Tanjore) is likely to prove a veritable future Rosetta Stone! Engraved on the copper *śikhara* on the *vimāna* of the Brihadiśvara temple at Thanjavur, the inscription has three versions, viz. Tamil (script Tamil), Sanskrit (Grantha script), and Marathi (Nagari script). It records the consecration of the *sīkhara*, *astabandhana* and *kumbhabhiseka* by Sivaji, the reigning king. It is dated Saka 1765 (A.D. 1843).

This date naturally rules out Shivaji, the founder of the Maratha State but refers to one who ruled at Thanjavur, almost towards the end of the Maratha rule, between A.D. 1835-1855. He was the last king of Thanjavur kingdom.

However, this is immaterial. What is important is the moral behind this 150- year old wisdom. (In fact, there is an earlier instance in Karnataka, where the feet of the huge Gomatesvara image bear inscriptions in Tamil, Kannada and old Marathi. It is not clear whether the inscriptions are identical but the moral is clear. It is this. In a vast county like India there are bound to be bilingual or even trilingual areas, particularly the border areas between two or more linguistic

23 *IAR.*, 1971-72, pp. 59-60.

24 Tulpule, S.G., "The Origin of Viṭṭhala", *ABORI*, Vol. LVIII-IX (1977-78), pp. 1009-1015.

provinces; for example, Belgaum on the Maharshtra-Karnataka border and Dang on the Gujarat-Maharashtra border. These regions have been bilingual as the study of place names from inscriptions spread over a period of 1300 years (C. 600 A.D.-1900 A.D.) shows. And they would be bilingual even in future. Hence, it would be an act of wisdom if administrators on both sides took a more enlightened view and take such steps that would minimise the linguistic causes of friction.

Likewise, with a view to fostering the unity of India, no attempt should be made to make any one language, be it Hindi in the north, or Tamil in the south, the sole language of administration. Languages like English should be allowed to be used along with the language of the region. Hence, the recent attempt to have everything in Hindi must be regarded as not only unfortunate, but harbinger of the possible, future disintegration of India !

While some stone or copperplate inscriptions of the known ruling dynasties in this or that part of India and of this or that period, continue to turn up, there are some, though of course very few, which do advance our knowledge of the political or cultural history of that region and of India as a whole.

Traikutaka Copperplate

That the political areas, particularly in Western India, was in a much disturbed state after the Sātavāhana rule is evident from the few records and coins of the Traikuṭaka, Kaṭachhuris, and the Vākātakas. How a ding-dong battle for supremacy took place is revealed by the discovery of two copperplate inscriptions of Traikuṭaka kings, Madhyamasena and Vikramasena, dated in (V) 256 and (K) 284 respectively by Dr. (Mrs.) Shobhana Gokhale.[25]

Both the records are issued from the victorious camp of Aniruddhapura, but whereas in the first record of V. 256, the camp was in the possession of the Traikuṭakas, in the second, it is said to be in the possession of the Kaṭacchuris. This seems to be a very significant difference. Hence, the assumption of Mrs. Gokhale that Vikramasena belongs to the Traikuṭaka dynasty, as suggested by the suffix—*sena*—might not be right. No victorious ruler—now or in the past—would make such a mistake, and say he is issuing a charter from "the victorious camp of his enemy." Hence we should await more proof. At the moment we should welcome the new rulers—Madhyamasena and Vikramasena. But what the exact role or relationship of these was with the Kaṭucchuris and the—Vākāṭakas remains to be investigated. Efforts should also be made to locate "Aniruddhapura," and the various places mentioned in the two grants.

Munda Records

Vakaṭaka and pre-Vakaṭaka history is illuminated by a set of copperplate of Ādityarāja. Both his family name Muṇḍa and the title *Rāṣṭra-mahārāja* are interesting. Muṇḍa like Goṇḍa suggests that the ruler belonged to this *ādivāsī* tribe, or was a

25 *Proceedings AIOC*, Ujjain 1972, p. 267, and *Studies in Indology and Mediaeval History*, Ed. Mate M.S. and G.T. Kulkarni, Poona, 1974, p. 93.

ruler of the region which included these and other *ādivāsis*. This, like Goṇḍa also occurring in Vākāṭaka records, is the first and the earliest mention of this people in the heart of Madhya Pradesh. The significance of this fact has not been hithero recognized by epigraphists and historians.

Likewise the epithet "Rāṣṭra-mahārāja" seems to have been used for the first and the last time.

While a number of Vākāṭaka copperplates have recently been found, the discovery of a stone inscription at Hisse-Borala by Dr. Gokhale is doubly important. For the first time the Śaka era is mentioned by name as "*Sakanripati Kāla.*"

This Devasena, we are told, built a dam across a lake and called it "Sudarśana." Apparently the fame of the similar feat by Rudradāman (and Skandagupta) had reached Vidarbha.

Hunas in Gujarat

The discovery and speedy publication of the three copperplates of the time of Toramāṇa by Professors R.N. Mehta and A.M. Thakkar is important from several points of view.[26] Firstly, it shows that in a vast country like India, it is not advisable to have only one centralized agency particularly, if it is inefficient and takes years and years before it reports the discovery in all its details to the scholars. Secondly, and this is much more important. Young students and scholars interested in the subject must have a chance to handle original objects—be it epigraphy, images or coins, or ancient sites. This cannot and should not be suppressed, as it was done—particularly in the field of epigraphy. The result is that but for a couple of centres in the country, this subject is almost non-existent.

It is against this background that the present publication should be viewed. For, it certainly advances our knowlege of the political, social, ethnic, economic and religious history of a part of India, viz the tract of land known as Shivabhāgapura (now between Gujarat and Madhya Pradesh, formerly Malwa).

Of the three plates, the first one refers to the third year of Śrī Storamāṇe, and gives him the *birudas Parama bhaṭṭāraka Mahārājadhirāja*. Under him was one Mahārāja Bhūta, as Viṣayapati—and then Mātṛudāsa. After 16 years (in the 19th year) were donated three villages, viz. Tanliyaka and Amrika and Saṁgamapallikā for the restoration and daily worship of the temple of a goddess built by the Queen Mother Virādhyika, and for the temple of Nārāyaṇa. (See Fig. 29)

Further local buisnessman as well as foreign traders had promised to pay the share of the duty on jaggery, salt and cotton for the maintenance and repairs of these temples.

Weights, Measures and Coinage

Several measures have been mentioned in the plate of year 3. Some of them like a

26 *M.S. University Copper Plates of the time of Toramana*, M.S. University Archaeolog Series, No. 14, Baroda, 1978.

donkey load or a cart load are of widespread use, both in time and space. The word Bhāṇḍa can be considered as a specific measure, being the amount contained in a specific vessel, but probably it also stands for a unit of measure. The word has been used both by itself and as *Bhāṇḍapaṭṭalika*.

The measure for land has been given as "*Vrihi Pitāka Vyāpaka*" in the Plate of regnal year 6. The Plate of regnal year 3 gives another measure for land-*Guṇṭha*. This word is in use even today but what it exactly amounted to in ancient time is not clear. The modern *guṇṭha* is, however, a measure of about 10x10 metres.

The measure for commodities mentioned in these plates are *Bhanda*, *Bhalla*, "*Donkey* load" and "cart-load."

Several words are found referring to coinage. Some of these are known, whereas the meaning of others is problematic.

"(1) *Vimsopaka*: It was equal to 1/20th of the standard silver coin of about 20 ratis. Probably it was a copper coin (*EI*. 29, 30; *CII*. 4). The words Viṁśopakinaka and Viṁśopakiniki seem to have been used synonymously for *Viṁśopaka*. (5 Viṁśopika-1/4 Rupaka (*EI*. 30, *pp*. 163, 181).

(2) *Pādinaka*: Literally it would meem 1/4th of anything. There is a Telugu-Kannada word called *Pādika* or *Pātika* which is 1/4th part of the gold coin called Pagoda or Huna or Varāha. It is more likely that Pādiṅika stood for the Pādaviṁśopaka, a copper coin from which we have Pavisa or Paisa.

(3) *Rupinika*: This is probably the same as Rupaka which was a silver-coin, 1/16th of value of a gold-Dinar in the Gupta Age. (*JNSI*, Vol. 2, *p*. 5). It was a silver coin and was the same as Dramma. P.V. Kane, in his *History of Dharmaśāstra*, Vol. 3, *p*. 122, gives Rupaka equal to 1/70 of Suvarṇa and 1/28 of Dinar."

While this is an excellent summary of what is given in these three copperplates, some further research into the antiquity, and survival of these weights, measures and even coinage should be very interesting. These, of course, would be of an ethnographic nature. Meanwhile, these plates but illustrate how well "organized," the economic system was. Equally well organized was the social system, wherein peoples from various religious faiths, as well as local traders and outsiders (not necessarily foreigners, unless by this expression are meant the Central Asian peoples—Gurjaras and Turks. This is probably implied by the expression *Vaideśya Vainejaka*.—Pl. 1, 1.4).

Foreign Element

That there were three foreigners involved in the grant is also clear from the names of business men. Even a study of these would throw very interesting light on the foreign element in Gujarat at this period. In fact, what the late Prof. D.R. Bhandarkar said long ago about the Gurjaras being a Central Asian people, had been substantiated by me by a detailed study of personal, names from the inscriptions of Gujarat. Now here is further confirmation not only in names of persons but by a specific mention of the foreigners—*Vaideśyas*. Besides the name or word Toramāna being Turkish even such names as Mudi—Modi, as pointed out by me sometime ago, is Turkish. And there must be many more. What is necessary is a deeper socio-linguistic study.

Lastly, there was social consciousness of the modern type as well. A goldsmith

had provided funds for digging a public tank, wherein a provision was made for medical aid to the persons attending to the temple affairs (Pl. II, lines 5—6).

Ramagupta and Jainism

Of signal importance is the discovery of three images of Jaina Tīrthankaras bearing an inscription on their pedestal.[27] These inscriptions are inportant, not only because they mention Rāmagupta as *Mahārājādhirāja*, but also because they mention the name of the Jaina Teacher Celukṣamaṇa, son of Golakyanti, and a pupil of Ācācya Sarppasena-Kṣamaṇa, who was taught by a pupil of a Jaina teacher, described as *Pāṇipātrika*, that is, a person (monk) who used only his hands as a vessel (*pātra*) for the purpose of eating and drinking. (See Fig. 31)

Though the Jaina monks are known for their stern way of life, suffering innumerable hardships, still this feature of being a *Karapātra* is one of the extreme steps, and a symbol of complete non-possession. Probably, this is an earlier instance than the one cited by Dr. U.P. Shah, from *Bhagavati-ārādhanā*.

The expression "*Pānidalabhoi*" means the user (enjoyer) of hands. It appears from the name "Sarppasena" that these monks were followers of a Nāga cult, and so on becoming hermits they have retained only the first part of their names and accepted the suffix-*sena*. According to Shah, Sarppasena might be a Digambara monk. This is also implied by the expression *pāni-pātrikā*, as mentioned above.

Apart from this cultural significance the inscriptions undoubtedly prove the existence of Ramagupta, as the predcessor of Chandragupta II. And the period, late 4th century A.D., is also unmistakenly suggested by the extant sculptural features, particularly the beautiful rendering of the chest, and the belly.[28]

Architecture

The discovery of two temples having an apsidal plan, and that two one over the other at Sonkh, near Mathura both dedicated to Nāga worship is of a two-fold importance.

First, these temples, along with those at Vidisa and Banavasi, Karnataka, also discovered during this period, and the earlier one standing at Ter, show that the earliest temples in India were apsidal in shape. That these were probably modelled on the thatched huts of the Todas seems to be confirmed. It is probable that these temples were also modelled on the earliest Chaitya shrines of the Buddhists, where a *pradakshina* was a necessary part of the ceremony. And this can be easily performed if the back portion of the shrine chamber is rounded.

And the Buddhists might have got the idea from a Toda-like hut. Anyway this point of view needs to be further investigated, the most important being whether apsidal huts were ever been made in U.P. and Bihar, and whether they are still being

27 Gai, G.S., "Three Inscriptions of Ramagupta", *JOI*, XVIII, 1968-69, pp. 257-51; also 251-53-55.

28 *Fig*. 2, Image of Arhat Pushpadanta, *JOI*, XVIII, 1968-69, p. 252.

built today by villagers. Very probably such huts are made even at present.

Equally important for the history of religious cults is the fact that both the temples at Sonkh were Nāga shrines. The implication is that at first Buddhism and later on Vaiṣṇavism, particularly, the cult of Gopāla Krishna at Mathura subdued the previously existing worship of Nagas. That at Mathura this worship was still current in the Ksatrapa-Kusana period. And it was only later, with the rise of the cult of Gopāla-Krishna, that the Naga worship became obsolete, or was absorbed by Hinduism, as the observance of Nāga worship shows. Thus in early Mahāyana Buddhism, a Nāga King and queen are shown as Chāmara-bearers to Buddha, whereas in Vaiṣṇavism, the cobra Ananta provides the eternal couch for Viṣṇu. Thus assimilation and re-assimilation of cults goes on in India all the time.

Temples—Their Types

The study of Hindu Temple architecture is at last reaching its logical culmination. First, there was the phase of discovery and pure description, followed by their grouping into various geographical zones. Then, came an attempt to understand the heart of the Hindu Temple, first by Coomaraswamy and then Stella Kramrisch. Acharya translated the *Mānasāra*, one of the well-known treatises on the theory of architecture. On the basis of the data supplied by this book scholars tried to group the existing temple forms into Nāgara, Vesara and Drāviḍa.

The Archaelogical Survey of India then launched a Temple Project, under which a full-fledged study of all the existing temples was started. This project has progressed well, but for some reason this excellent work has not seen the light of the day. However, the work is continuing. And already pre-Gupta temples in the north, and temples of Kerala in the south have been fully described.

Fortunately, the American Academy of Indian Studies, Varanasi, also showed interest in similar studies. More academic-minded, and endowed with ample funds, it has not only photographed all important monuments, but with the help of scholars, like Shri M.K. Dhaky, embarked upon the interpretation of the temple forms and their decoration. This task requires not only good knowledge of Sanskrit, but of temples themselves—a thing which Acharya did not have. This rare combination of talent Dhaky has utilized well and we have a number of publications in English and Gujarati.

Dhaky has succeeded in diflerentiating between the temples of Rajasthan and Gujarat from those of Malwa, and Kalinga.

More recently he has found references in inscriptions from Karnataka which speak of these basic styles, viz. Nāgara, Vesara, and Drāviḍa, but also seek to illustrate them on the temples of Northern Karnataka. Thus, we have evidence from the "horsés mouth", the architects and sculptors of Karnātaka in this case. What they regarded or understood as Nāgara, Vesara and Drāviḍa.

The differentiation or classification of temple Sikharas into several styles, as coined by temple-builders—not kings, but architech, called Visvakarma—is not only interesting, as a necessary step in understanding the differing forms of Hindus reli-

gious architecture, but also significant in another way. As Dhaky has observed, only the Northern Karnataka architect, and to extent that of Deccan, showed a desire to know and reproduce the models of Northern sikharas on the niches and walls of temples he built in Karnataka. A similar desire was never evinced by the Northern builders as well as by those of Tamil Nadu.

This is a characteristic feature of Indian social, political and cultural life. A Hindi-speaker would not care to learn Tamil, and *vice-versa*, whereas both in Karnataka and the Decean some Hindi-speakers can be found.

And when the Karnataka architect sought to embellish his temples with Northern temple forms, he often overdid it, making them literally "museum pieces," as Dhaky notes.

At present we have at least three definitions of Nāgara. These are given by—

(i) *Aparājitaprachā c*, 1175 A.D.
(ii) *Kāmikāgama*—a Saivite work from South India, c. 1175 A.D.
(iii) Temple builders and writers on the science of architecture (*Vāstuśāstra*) from Tamil Nadu and Kerula.

These different interpretations or definitions might be explained as follows. We shall take up that of Tamil Nadu first. According to the various *āgamas* quoted by Dhaky, a temple in Nāgara style was one which was square from the plinth to the finial. One wonders whether these *āgamas* had the earliest temples in view !

For, the Nāgara temple, though square on plan, was round from *grīvā* (neck) onwards in some instances—the *Latina* variety specially was basically circular and *aṣṭakarna Lati* or *Latina* was a name applied from about the 10th century to the temple with a single spire. This was the earlier form of the Nāgara. From it, from about the 7th centnry, a multi-spired—Śikhara was evolved. Hence the mediaeval North Indian works form the inspiration behind the Nāgara style.

This was the definition which the *Aparājitāpractchā* accepted two centuries later. But the *Kāmikāgama*, according to Dhaky understood by the Nāgara a sort of Orissan temple, covering its *Latina* or quasi-Latina as well as its derivative, the Śikhari variety.

This confusion in interpretation—and confusion it is—was made worse confounded by the Karnataka temple builders. As Dhaky well puts it, "the Northern Indian Temple forms depicted on the Karnataka *vimānas* are Nāgara from the view-point of the Karnataka builders." He illustrates these from Gadag (*Fig*. 18), Haveri (*Fig*. 6), Lakśmesvara (*Fig*. 7), Hangal (*Fig*. 4).

However, the architech of Kuntala (southern Karnataka), once ruled by Hoysalas, made a complete mess, as illustrated by the temple at Kikkeri, where a strange mixture of true Nāgara and Drāviḍa forms is witnessed.

Thanks to Dhanky's penetrating studies, we are able now to understand what was happening in the architectural field some 600-700 years ago. As it is today, several regional, sub-regional influences were at play. Perhaps these were mostly actuated by a desire to show off, rather than a desire to learn.

The result was very often hybrid forms. All down the centuries, these passed off as forms of decoration, to be admired or not, according to the viewer's own predilic-

tion. As today seen in our dress and films and also buildings, very often there is senseless imitation. This passes off as "fashion". And the artists in Karnataka were victims of these "fashions".

Gothic in Indian Art

Dhaky has also illustrated another trait in Karnataka temples. This is a conception of ornamentation which in motive, feeling and application, approaches even stimulate in terms of Indian idiom—what Dhāky calls the "Decorated Gothic". This is best illustrated by the wall decorations on the *jaṅghā* (wall proper) of the *vimaha* (sanctum) of the Kaṭṭeśvara temple at Hirehadagali in South Karnataka, where the shrine-nickes in high relief are vaguely reminiscent of the interior of a Tudor Gothic Church, in England. (See Fig. 36)

"But it is on the upper part of the wall, that an ornamentation strongly reminiscent of Gothic proper is present. The candelabrum-formed brackets, very metallic in appearance, emanate and flow from the lotus rhysones below the capital of the pilasters, terminating in stylized lotus-cups, supporting a plant-pedestal, now spanning, now stepping midway between the slender wall pilasters of great elegance (*Fig*. 2).[29]

As Dhaky wisely points out, there is no evidence of borrowing of one from the other, the Indian being slightly earlier. This is an instance in the history of art when the Eastern and the Western mind conceived motifs and expressed them in a way strikingly similar in ages, more or less close and reflecting the spirit and nuances of surprisingly identical conceptualism.

Dhaky[30] has also drawn attention to a rare architectural expression, and its existence. This is *ākāśaliṅga*, meaning a *liṅga* exposed to the sky. (See Fig. 34)

This can only happen when a *liṅga* is placed on the upper end of the temple spire. The expression occurs in *Samarāṅga-sūtradhāra*, a work on temple architecture composed in Malwa in the 11th century. According to Dhaky, the temple featuring *ākāśaliṅga* are confined to Orissa, (some) Himalayan States, Karnataka and Western Andhra Pradesh. Further, only temples with a single spire or Śikhara have the *ākāsaliṅga*, e.g., Siddheśvara temple, Gandharadi, Orissa, C. 10th century A.D.

Rastrakuta Temple

Some 30 years ago, I had said that unless a planned effort is made, we shall not be able to distinguish the temples of the Rāṣṭrakūtas from those of their predecessors and the successors—the Early and Late Chālukyas. This suggestion has borne fruit. Now temples, built by this dynasty, are being discovered. And Rajendra Prasad[31] reports two such temples known as Rūpāla Saṅgameśvara and Bhujaṅgeśvara at Bhavanasi Sangam, District Kurnool, Andhra Pradesh.

29 Dhaky, M.A., "The Gothic in Indian Temple Architecture," *East and West*. 24, 1974, p. 138.
30 Dhaky, M.A., "The Ākāśaliṅga Finial," *Artibus Asiae* Vol. XXXVI, (1974), pp. 307-15, pl. 1-4.
31 Rajendra Prasad, B., "Rāṣṭrakūṭa Temples at Bhavanāsi Sangam," *Artibus Asiae*, Vol. XXXIV, (1972), pp. 211-16.

Among the typical Rāṣṭrakūta features, are the figures of Ganga-Yamuna, as in the Kailasa at Ellora.

Sculpture and Dancing

That there is a close and intimate relationship between Indian sculpture and Indian dancing throughout its history of 18 centuries has been well brought out by Kapila Vatsyayana.[32] Interesting and important is her conclusion that "there was only one tradition of Indian classical dancing which existed throughout the length and breadth of India and it is this tradition that found its flowering in the various styles which are known as the contemporary classical dance styles of India."

Sunga Influence in Bengal ?

The Śuṅga succeeded the Mauryas, and as far as the art forms are concerned, typical Śuṅga monuments—stupas with the accompanying sculptures—and terracotta figures are found in Central India, as well as Vidarbha.

How far east did this go ? It appears that it had reached Bengal as well, as shown by a typical terracotta figurine from Chandraketugarh, District 24-Parganas.[33]

Kusana Terracotta

Ever since its excavation more than 60 years ago by John Marshall, Bhita, in District Allahabad, U.P. was known as the respository of several interesting objects which would illustrate India's early history. Unfortunately the site was dug in the old fashion, and the finds described on stylistic grounds only. Hence such an important site is little known to younger generation of scholars. Now Samir Mukhopadhyay[34] has re-suscitated the terracottas, lying in the Indian Museum at Calcutta. These as his study shows includes not only terracottas of the Maurya and Gupta period but of the intervening Kusana period as well. And this helps to remove the impression that Dr. M. K. Dhavalikar and I[35] had formed that the Kusana artists had concentrated on stone sculptures only. As a further corroboration of Mukhopadhyay's view we have now fresh stratigraphical data from Purana Quila, Delhi, whence a typical Kusana head is illustrated.[36]

Skanda

Skanda, dancing, and six-headed, and feeding his *vāhana*, the peacock is certainly

32 "Classical Indian Sculpture and Dancing." *JOI*, Vol. XI, 1961-62, pp. 247-59.
33 *IAR*, 65-66, p. 59, pl. XLVA.
34 "Terracottas from Bhita", *Artibus Asaie*, Vol. XXXIV 1972 pp. 70-94.
35 In *Marg*, Vol. XXIII, No. 1, p. 45.
36 *IAR*., 1970-71, pl. XXVI A.

rare.[37] It is found sculptured in a niche in a temple of the Pratihara period, at Choti-Khatu, District Nagaur, Rajasthan.

Nirruti, supposed to be a god of evil in the later Saṁhitās, not only lost his divinity, but was later regarded as the lord of demons. So he was rarely sculptured on Hindu temples. One such figure is found in the Paccalasomeśvara temple at Pānugal,[38] two miles northeast of Nalgonda, A.P. This is in striking contrast to his metal image, perhaps the earliest, known so far, and recently recovered from the excavations at Sonkh.

GAṆEŚA ANTIQUITY

When did Gaṇeśa enter the Hindu Pantheon and become an important god in his own right ?

Evidence from the extant temples in Gujarat, Maharashtra and Madhya Pradesh indicated that it was some time in the 7th-8th century that Gaṇeśa came to be sculptured as a *Maṅgala-murti* on the door frame of temples, whether these be of Śiva, Visnu, Brahmā or a Devī.

It was also at this time that some Mss., as well as a few inscriptions had the invocation to Ganesa, at the beginning, instead of an invocation to any other deity.

Both these kinds of evidence seem to be supported by panels of Mātṛikās of the Kushana period from Mathura and elsewhere, sculptured either alone or with Skanda standing, and of the Mātṛikās sitting and Skanda standing and also of mātṛikās sitting, with Shasthi between Skanda and Viśākhā, and of Shasthi between Skanda and Viśākhā, and of these in which the *Mātṛikās* appear seated or standing, headed by Śiva, and followed by Gaṇeśa (Mandora. Jodhpur) (*Fig.* 1 *Early Prathāra*, 7th century A.D.).[39]

Probably, the Mātṛikās at Besnagar, shown seated in European position and dated to the 6th century A.D , were also unaccompanied by Śiva or Gaṇeśa[40]

Thus, it is clear that Skanda and Matrikas had an independent existence and had not become a part of the Śava pantheon. The latter was still in a formative state. Hence, nowhere do we and Gaṇeśa either associated with Śiva, Mātṛikās or Skanda.

This possibly was the situation in the Gupta Period, wherein two prominent Gupta kings were named after Skanda or Kumāra. No Gupta inscriptlon has an invocation to Gaṇeśa.

It is against this background that we have to view the attribution of a beautiful standing Gaṇeśa figure, now in the Dargah Pir Rattan Nath, Kabul, to the latter part of the fifth century or early sixth century A.D.[41] (See Fig. 37)

37 Agrawala, R.C., "Pratihara sculptures from Choli-Khatu, Rajasthan" *JOI*, Vol. XXIII, 1973-74, pp. 70-74, *Fig*. 9, Since it is indistinct it has not been reproduced.

38

39 Agrawala, R.C., *East and West*, 1971, pp. 79-80, *Fig*. 2; *Fig*. 7, and *Fig*. 17.

40 *Ibid.*, *Figs*. 19-20.

41 Dhavalikar, M.K., "A note on Two Ganeśa Statues from Afghanistan." *East and West*, 1971, p. 332.

Ithink D.C. Sircar was right in assigning it to the seventh century on palaeographic ground.

More important than this are the *birudas* of the Sahi king Khingala and the great many details about the date of the record. He is called *Parama-bhaṭṭāraka mahārājādhirāja*. The record is dated in the eighth year of his reign, in *mahā-jyaiṣṭha māsa, trayodasi, viṣākhā naksatra* and *siṁha-lagna*.

To my knowledge this is the first record either in India or elsewhere, which mentions the *nakṣatra*, as well as the *lagna*. As far as we know the history of Indian astrology, these—particularly the mention of the *lagna*—are comparatively a very late feature.

Pāṇini does not use *Lagna* in a technical sense,,[42] but Varāhamihira does, when in Adhyāya II. 5[43] he mentions along with *tithi, divasa, nakṣatra, karaṇa, mūhurta, lagna, yoga*, thougha A.M. Shastri[44] does not mention it, as such.

Thus, it would be advisable to place this beautiful Gaṇeśa, somewhere in the seventh century. Though the ornaments and the proportionatily modelled belly and the depiction of the dhoti might suggest a slightly earlier date.

Gaṇeśa in Iconography

There is considerable difference of opinion among scholars on the antiquity of Gaṇeśa images, and thus on the actual worship of Geṇeśa, though we have undisputed evidence about the Lord of Gaṇas in the late Vedic text.[45]

This question has become crucial, becauge during the last few years, two very interesting Gaṇeśa figures were reported from Afghanistan. (as mentioned earlier).

Now according to A.K. Narain,[46] attempt to depict Gaṇeśa has been made on a silver drachm of Aermaens, now in tne British Museum.

If this view proves to be right, it would be very important for the antiquity of Gaṇeśa worship. We might then say that the Greeks gave a form not only to Śiva, Viṣṇu, Krishṇa. Balarama, and Buddha but also to Gaṇeśa.

Antiquity of Gauhati

How old is Gauhati ? Nothing was known for certain. Traditionally, according to the *Mahabharata* and some Puranas the capital of this rain-fed valley was Prāgjyotiṣapura. Extant temples, and stray images definitely indicated that by the ninth century at least, contact had been established between the Brahmaputra Valley and the heart of India. (See Fig. 42)

Then all of a sudden proof came, while laying down the foundation of a large

42 Agrawala, V.S., *India as known to Pāṇini*, p. 178.
43 Kern, H., *The Bṛihat Saṁhitā*, p. 8.
44 *India as seen in the Bṛhat Saṁhitā of Varāhamihira*, 1969.
45 Kane, *History of Dharma Sastra*, Vol. I, p. 53.
46 *JNSI*, XXXVI, 1974, p. 190.

public building at a place called "Ambari" situated on the old course of the river in the heart of the city. Remains of houses, broken images and pottery were found at this site.[47] At that time in 1970, I happened to be there. So a proper excavation was planned, and two scholars from the Deccan College—Dr. Z.D. Ansari and Dr. M.K. Dhavalikar—were deputed to carry it out. Unfortunately, owing to the high level of the sub-soil water, deep digging was not possible and thus an excellent chance of ascertaining the origin of Gauhati was lost. However, whatever was done has been fully reported.[48] From the earlier finds, only the torso of a beautiful figure in kaolin is here illustrated. (See Fig. 40)

Buddhist Stupas

Discovery of Asokan edicts at Panguraria, near Bhopal and at Nittur, District Bellary, though appearing sporadic, furnishes evidence, if it be at all necessary, as to what far-reaching steps Asoka had taken in preaching the essentials of Buddhism, throughout the length and breadth of India, which at that time included Kandahar then (Gandhara) in the north-west and Kanyakumari (Tāmraparṇi) in the south. No doubt these edicts were couched in Prakrit and written in Brāhmī, which if not the national language, and the script, were the most widely understood ones in India of yore.

But wherever necessary, for example at Kandahar, the same edicts were recorded in Greek and Aramaic. This was a far-sighted step, because this frontier region was bilingual or multilingual. Hence, it was nothing but wisdom to use Greek as well as Aramaic.

Along with Asokan edicts, remains of Buddhist stupas continue to be found all over India, sometimes with remains of adjacent cities which maintained the Buddhist monks and others in charge of the religious establishments.

These Buddhist stupas are often found (for instance, at Tumain, District Guna, on the route from Mathura[49] to Vidisha) on the arterial roads connecting important political or trade centres, but at times in the heart of forested regions, which are the home of *ādivasis* today and must have been so even in the distant past. When we see these, particularly the latter, in a historical perspective, we see that the method of proselytizing has not essentially changed. What Christian missionaries have done in Madhya Pradesh or Assam was done by Buddhist missionaries, for instance, at Deonimori in north-eastern Gujarat, and Pauni in the Vidarbha region of Maharashtra.

These two stupa complexes further illustrate the development in Buddhism, and at the same time, reflect the impact of new political and cultural influences, both indigen- and foreign, particularly, on the stupa decoration.

The Deonimori stupa, though built in the heart of the forested region, still has well-carved acanthus leaves for its decoration. Such Graeco-Roman motifs are

47 *IAR*., 1968-69, pl. IV.

48 Dhavalikar, M.K......."Archaeology of Gauhati" *BDCRI*, Vol.XXXI (1973) pp. 138-48.

49 *IAR*, 1971-72, p. 28.

50 Deo, S.B. and Joshi, J.P., *Pauni Excavation* 1969-70, pl. XXIV, pls. XXVII-XXXI.

absent in the earlier Bharhut-Sanchi, and even Pauni stupas. Pauni mainly being a Maurya-Śuṅga monument has full-blown lotuses and other Indian motifs,[50] whereas at Deonimori, we have the acanthus[51]. (See Fig. 41)

Such large and small stupas also existed elsewhere, hence the popular tradition that during the time of Asoka, no less than 84,000 stupas were built all over India. Though this number is certainly exaggerated, there is little doubt that there was a large number of such monuments. Besides the two already mentioned, ruins of large stupa complexes were identified at Sannati and Vanavasi in Karnatak,[52] and Sanghol in the Punjab. The one near Bhopal has already been noticed under epigraply.

Banavasi

Banavasi was known as Vaijayanti, and was the capital of the Satavahanas and Kadambas in the early centuries of the Christian era.

Though not right on the coast, it must have been a place of great commercial importance. For one of its bankers (śresṭhi) Bhutapāla had got excavated one of the finest Chaityagrhas in the whole of Jambudvipa at Karla. This nearly 2000 year old announcement was not an idle or vain boast. For the banker knew very well what he was telling the whole world, in the only means then available, namely the facade or the wall of the Chaityagrha at Karla near Pune.

If this Banavasi can be excavated horizontally, it would give a good idea of Sātavāhana-Kadamba city. Even the small sporadic excavations, during the last 10 years, have laid bare the remains of a large apsidal structure, which does not seem to be an ordinary apsidal temple, but the remains of a Buddhist stupa planned like a *dharmochakra.*[53] This becomes clear when we compare the photograph of the Banavasi structure with that of a similar structure unearthed in 1971-72 at Sanghol, District Ludhiana, Punjab.[54] Whereas in the former, only one radiating spoke of the wheel is seen (or has been exposed), in the latter, two broadly spaced, wide areas are pierced by five radiating spokes.

Probably these are the few examples of such *dharmacakra* type stupas. The one at Banavasi is placed in the Sātavāhana period, and probably the same would be the time of the Sanghol stupa, as the pre-structural deposit yielded crude black and grey wares.

Anyway for understanding the stupa architecture these two remains of almost fully, but also carefully, excavated stupas at Deonimori and Pauni make a welcome addition to our knowledge of this subject.

51 Mehta, R.N. and Chowdhary, S.N., *Excavation at Deonimori*, Baroda, 1966.
52 Rao, Nagaraja, *Progress of Archaeology in Karnataka*, Mysore, 1978.
53 *I.A.R.*, 1970-71, pl. XLV.
54 *Ibid.*, 1971-72, pl. XLIII.

Piprahava

Equally interesting and important is the probe, after nearly a century at Piprahava, District Basti, U.P. This site on the border of Nepal is believed to be the site of Kapilavastu, the birth-place of the Buddha, or the capital of the Śākyas.

Earlier excavations had yielded two caskets placed in a stone box, and one of these caskets was inscribed in Asokan Brāhmī. Small excavations in 1970-72 showed that the caskets had been placed in a stupa which in its latest stage had a square base, and had niches on the sides. Further, this stupa enclosed a mud stupa, enclosed by a single course of baked bricks. When this mud stupa was carefully probed, it yielded two soapstone caskets. Thus, there is little doubt that Piprahava had more than usual significance in Buddhism. And as conjectured, this place is probably the site of the ancient Kapilavastu.[55]

As is well known, Bihar could boast of two universities of international reputation. Of these the remains of Nālandā with its huge residential monasteries and shrines were brought to light between 1914 and 1920.[56] Even now these evoke our admiration. Slightly later than Nālandā was Vikramaśilā. The site of this is the present Antichak, in Bhagalpur District. Excavations for several seasons, first by the Patna University, and since 1971 by the Archaeological Survey[55] of India, have revealed the remains of stupas, monasteries with huge courtyards, and images of the Buddha and Tantric pantheon in stone and bronze. However, no idea can yet be had of the university complex. Probably this needs a different strategy than usually followed in such excavations.

Even in Western India, in Saurashtra as well as Konkan, Buddhism continued to be taught and preached by a band of Bhikṣus and Bhikṣuṇīs. This was known from the occasional references to these Vihāras in Maitraka copperplates. A newely discovered Saindhva copperplate also supports this, while Dr. (Mrs.) Gokhale's discovery of new inscriptions at Kanheri tells about several Buddhist teachers with specialization in this or that branch of Buddhism, as their title *Ṣaḍbhiñāna*, *Patisambhidā* and *Jhāyi* indicate.[58]

Buddhism

Though the general significance of the occurrence of an Asokan edict or stupa in this or that part of India was known or realized long ago, still a deeper or further consideration of some of the recent discoveries in Vidarbha, Gujarat, Madhya Pradesh and Karnataka leads us to think that it was not ouly the spread of Buddha's message in different parts of India, but the choice of such places at Deonirmori, on the Gujarat Rajasthan border, or Pauni in VIdarbha and Nittur in Karnataka, would show that these were the first organized attempt to convert the adivasis of the thickly forested regions of India.

55 *IAR*, 1971-72 p. 4.
56 See Sankalia, H.D., *The University of Nālandā*, 1973.
57 *IAR*. 1972-73, pp. 36; 1973-74, p. 8.
58 Gokhale, Shobhana, "*Epigraphical work in Maharashtra*" (Unpublished Ms).

Asoka deliberately left out towns and cities and villeges, though parts like Sopara had received the attention they deserved.

Fortunately, this policy was also followed by the Sakas and Kushanas. Hence the stupas at Deonimori and Pauni were later enlarged and enriched with figures of Buddha. While undergoing this religious change, they did not escape the other cultural changes brought about by contact with the Graeco-Roman world. Among the various signs of ornamentation, we now notice the presence of beautifully carved acranthus leaves in terracotta.

Roman Influence on Indian Art

This, viz. the Roman influence on Indian art and architecture, had not been recognized earlier, though several scholars—Indian and foreign—had postulated Persian influence in the Asokan pillar capitals. But few scholars had ever thought that the earliest Hindu temples, dated in the Gupta period, at Nachna, could have been inspired by the earlier Graeco-Roman examples, with their floral and figure ornamentation. But this is what has been pointed out by the late Dr. Goetz, by citing examples from dated Graeco-Roman monuments. From these a few—the flying Gandharva couple from Badau and their likely ancestors, as well as the floral ornaments and coiffures of women—have been illustrated.[58a]

It appears that this aspect of the temple architecture and sculpture has not drawn the attention of Indian scholars, as it should.

Fortifications

The excavations at Sisupalgarh in Orissa showed, (as the recent ones at Surkotada in Kutch) that place-names ending in *gaḍh* (and *koṭa*) might be fairly old.[59] If these are plotted on a map, districtwise and statewise, and a few excavated, we might get a fairly reliable history of such towns/cities in ancient India.

It is from this point of view, that the reported discoveries of such fortifications at Chandraketugarh, District 24—Pargana, and that of Nalrajar Garh in District, Jalpaiguri are important. At the latter site there is a massive brick structure, said to be "the first of its kind in West Bengal."[60]

Chandraketugarh (See Fig. 43)

The fortification was found to be rectangular on plan, and girded by a moat. Particularly interesting, nay intriguing, seems to be a chain of niches, 0.44 m. broad at the base and 0.66 m. high, aligned on the southern buttress of the western rampart. These niches are 15 in number, and have a sloping base and a reclining chimney made of terracotta rings within the core of the buttress, ultimately opening on the top.

58a Goetz, H."Impirial Rome and the genesis of classic Indian art" *East and West*, pp. 153-11.
59 *Ancient India*, No. 5, pp. 62-105.
60 *IAR*, 1966-67, p. 45.

These niches, aligned immediately above a ledge or platform and having signs of burning, *structurally appear to be a series of furnaces for smelting purposes.*

This conclusion hardly seems convincing. If these were for so many furnaces, there must be some sort of slag. Usually such niches are found on the upper part, and various other parts of fortification for shooting purposes. One, therefore, wonders if these angular niches could be of the Gupta period.

The discovery of early historical fortified sites at Kharligarh, District Bolangir, and Asurgad, district Phulbandi,[61] is indeed very significant, particularly the one at Asurgad. This is situated near the confluence of the Tel and the Mahanadi, four kilometres from Sonepur town. The front side of the site has a wall pierced by gateways, while the remaining sides are guarded by the rivers.

Now this Sonepur was the capital of a dynasty which was said to be ruling over Western Lanka in the 9th-10th century A.D.[62]

The names Asurgad and Sonepur might have given rise to the legends about Laṅkā, the capital of Rāvaṇa who was called Rākṣasa/Asura, and Laṅkā was said to be of gold.

Inyestigations at these sites should be interesting.

Champa

Among the few ancient city-sites, excavated during this period, was Champa, situated in the Bhagalpur District of Bihar. Three season's excavations[63] by the Patna University have yielded the remains of a mud rampart, and habitational remains from the Maurya—Mediaeval Period.

However, this much seems certain that the foundation of the city goes back to the Maurya Period. To this period belong the NBP, the fine female figure in ivory,[64] a toy cart made of tortoise shell, several stone moulds, and Nāga figurines. All these singly and cumulatively testify to the artistic excellence Bihar had attained during the Maurya Period. (See Figs. 46-49)

Above all, it is to this period that we can confidently attribute the foundation of fortified towns/cities, referred to in our epics.

Mediaeval Archaeology

India is so rich in archaeological remains that we can no longer confine our attention to the old or very old remains. Even remains of as late as those of the 17-18th century should receive equal attention from archaeologists as well as art-and-culture historians. For after all the history of a nation or a country should not have breaks or gaps. It is also immaterial whether the period or periods under discussion have produced, or not, very artistic works. Hence it was necessary to direct attention not only to the

61 *IAR*, 1968-69, p. 68.
62 *EP. Ind.*, Vol. XII.p 237.
63 *IAR*, 1969-70, p. 2; 1970-74, p. 4; 1971-72, p. 4.
64 *IAR*, 1971-72, pls. X-III.

monuments, but to the works of their earlier and later contemporaries. And it was indeed essential that our attention should not be focussed on the art works only, but on the way how the people lived. Hence, a full-fledged study of their palaces and houses was long overdue.

Champaner

It is from this broader, more enlightened point of view of archaeology that we should view the excavations of the M.S. University of Baroda at Champaner. Champaner was made a second capital by Mahmud Begada of Gujarat, because of its fertile soil and also because it lay almost on the frontier of Gujarat and Malwa. Several seasons of excavations have laid bare large parts of the city with its palaces, baths, fortifications, etc., but the exact use or functions of all the structures cannot be ascertained, because curiously the residents have left nothing behind before deserting this most prosperous city of the 15th century Gujarat.

Shimoga

It is in this light that we should also welcome the exposure of the palace of Sivappa Nayaka of Keladi (A.D. 1645-1660) at Nagar, District Shimoga.[65] The palace covers an area of 34.75×20.75 m. and was built over a bluff in the centre of the fort. It had iwo courtyards of equal dimensions. The central hall built in laterite stone was thickly plastered, and was provided with beautiful niches.

Silahara Palace

There is hope of discovering a still earlier palace in Konkan, Maharashtra, if the brief notice of the discovery of the plinth of a Silāhāra palace at Jalgaon, Taluk Dapoli, District Ratnagiri, has any significance.[66]

SPITI VALLEY

Wall Paintings

This period is also notable for the explorations carried out by the Archaeological Survey of India outside India or in our border regions.

Of the latter, so far only a brief report has appeared of the work done in the Spiti Valley, District Lahaul and Spiti[67] in Himachal Pradesh.

Of the two Buddhist monasteries, one known as Ki and the other Tabo, the latter seems to be important for our purpose. For here the wall-paintings have remained in fairly good condition and they are old as well.

65 *IAR*, 1971-72, p. 39, pl. XLII.
66 *IAR*, 1970-71, p. 67.
67 *IAR*, 1965-66, p. 36; pls. XVIIIA-XX.

The monastery of Tabo is situated about 58 km. from Kaza further down stream, The monastic complex presents a picturesque view. Built of mud-brick, these have defied the ravages of time. The wall-paintings are said to recall "the Ajanta tradition in so far as the colour scheme, composition and line-drawings are concerned." Hence, it is described as "the Ajanta of the Himalayas." The figures of the Bodhisattva, and other deities are depicted according to the classical Indian tradition, while the devotees are shown in their local costume.[68] (See Fig. 44-45)

Maharashtra : Mediaeval Wall Paintings

Such wall paintings have been now found in several districts of Maharashtra, which was hitherto supposed to be bereft of art tradition, as the rulers were too busy with warfare. But not satisfied with mere discovery, Miss Kamal Chavan, a pupil of Dr. M.S. Mate, has visited all the eighteen *Wādās* (palaces of the Peshwas and their ministers) and studied these paintings from the point of view of art (technique) as well as content. Thus, a welcome light is thrown on the life of the period (1650-1850 A.D.) from a hitherto neglected source.[69]

Of course, this was not an unexpected development of studies in Mediaeval and Later Mediaeval archaeology in India. Earlier, Dr. Mate himself had followed up his study of *Maratha Architecture* by similar studies of *Islamic Architecture*, and *Deccan Woodwork*. In the former, the author has tried to ascertain the basic principles that governed Islamic architectural planning, and the changes these underwent from time to time.

Woodwork

The publication of the *Deccan Woodwork*[70] was an indeed eye-opener. For until its appearance, in 1967, scholars and laymen knew or had heard of the woodwork of Gujarat and Rajasthan. No doubt, these neighbour states might have inspired this art, as did Karnataka in the south. The next question was "would the influence be confined to woodwork only ?" The answer was supplied by the wall paintings in the Jaina temple at Jamoda, District Jalgaon. Fortunately, it has become possible to publish Dr. Mate's study in full and as a separate monograph with one colour plate.[71]

All these studies had a chain effect. Dr. Mate and his pupils, began to examine their own collections in Bharat Itihas Samshodhak Mandal (BISM), Poona.

This led to the discovery of a manuscript which contained beautiful paintings on *tāla* (musical time-beating). A study by Miss Usha Ranade and Miss Kamal Chavan showed that though there are a number of miniatures of *ragas* and *raginis*, none was hitherto known about *tāla*. Hence, this unique manuscript study. It has now been published by the BISM, as it should be, in a large format, with two colour plates.

68 *Ibid.*, p. 37, pls. XX, XX1A.
69 Chavan, Kamal, *Maratha Murals*, Ph.D. thesis (unpublished) Poona University, 1978.
70 Deccan College, Poona, 1967.
71 Mate, M.S., *Jamoda Jaina Murals*, Deccan College, 1977.

So what began a few years ago as a new venture, stray sorties into the architecture of the Marathas have developed into a multi-faceted study of all aspects of the Mediaeval and the Later Mediaeval Period.

We can only wish that such work—even a beginning—should be made in other Universities. For it is not Gujarat or Maharashtra which has this wealth, *but the whole of India.*

The Epics and Archaeology

How far do our epics—the *Mahabharta* and the *Ramayana*—and the various Puranas truly portray our past history ?

This question has been vexing the mind of scholars for more than a century. Nothing much could be done, unless we had critical editions of these works. These are now fortunately available for the two epics.

The next step is to examine their contents and put them in a more reliable space-time context.

This could be done to some extent with the help of archaeology. But the latter itself must rest on a more secure foundation than it had been done hitherto.

With the era of stratigraphical excavation which began in 1947, first Nasik and then Maheshwar were excavated. Both these proved that these sites were fairly old, and would easily go back to C. 1000 B.C. Later Dwarka[72], Tripuri (Tewar)[73] and Pandharpur[74] were similarly probed. However, these excavations showed that the present site of Dwarka was not older than first century B.C.-A.D., Tripuri not older than the sixth century B.C. and Pandharpur not earlier than the 12th-13 century A.D. Of course, these were small vertical excavations, as was the one of at Hastinapur, made by the Archaeological Survey of India in 1951-52, and need to be extended, whenever such a possibility occurs.

Presently, Prof. B.B. Lal is excavating Ayodhya and other sites—such as Sringaverapura, Bharadvaja ashrama, and all connected with the Ramayana.

The results of these excavations are not encouraging from the orthodox point of view, as are those of Sonkh near Mathura, though they confirm the conclusions which the author had already reached earlier by a very critical study of the Ramayana. Lal's excavation shows that even Ayodhya cannot be earlier than the 6th-8th century B.C., whereas the other sites are probably of the same period.

These results bear out the conclusions which the author had reached much earlier by a detailed archaeological study of the *Rāmāyaṇa*. In fact, such a study he had attempted

72 Ansari, Z.D. and M.S. Mate, *Excavation at Dwarka*, 1966, Poona.

73 Unfortunately the reports on there have not been published, though the preliminary report is ready.

74 Mate, M.S. and M.K. Dhavalikar, Pandharpur Excavation, 1968, *Bulletin, Deccan College Research Institute*, 1970, pp. 1-42.

also with the *Mahābhārata* as far back as 1944, and, later on, one of his pupils, Dr. B. Chapekar, had gone in for whole of the *Mahābhārata*.[75]

The application of this method to the *Rāmāyana* was of a very far-reaching importance. It showed that most of the events in the epic, such as the giving of Rama's *pāduka* to Bharata, and his signet-ring, that is the ring bearing his name, to Hanuman could not be earlier than the 1st-2nd century B.C. Likewise, it was shown, more conclusively than before, that the original Laṅkā could never be in Ceylon or Śri Laṅkā, but it must be somewhere in eastern Madhya Pradesh, or near Sonepur on the Andhra-Orissa—M.P. border.

Hence, I came to the conclusion that the present *Rāmāyana* in one sense was a myth, that is, unreal, but it has a basis in fact as well.[76]

The publication of this work as well as articles on the date and nature of the *Mahābhārata* war created great interest and even controversy in the country. But these had reached a fever-pitch, when during the Emergency the press and the radio took part in it by encouraging the participants on both sides, as they had nothing much to report.

However, the matters should not be left to the press. What is needed is an unbiased approach. And this has been attempted by the writer in his work *Rāmāyaṇa in Historical Perspective*.

An archaeological study of the *Mahābhārata* has been completed by one of my pupils, Miss Gauri Lad.[77]

75 Chapekar, B., Ph.D. thesis (Unpublished), Poona University, 1958.
76 Sankalia, H.D., *Ramayana: Myth and Reality*, Delhi, 1973.
77 Ph.D. thesis, Poona University, 1978.

PART IV

Environmental Archaeology

ARCHAEOLOGY AND ENVIRONMENT

Indians have begun taking increasing interest in knowing the past environment, whether it be of the earliest Stone Age or some later period. While for the latter, if it be of a historical period, some written document might be available, for the pre-writing period, which is several times longer than the historical, there is nothing but natural rocks, sand, gravel, rivers, waterfalls etc. Scientific study of all these and many other ancillary details had begun in the west in the last century. It got a great fillip after the Second War, because this had a direct bearing on archaeology. In England, first London and then Oxford and Cambridge instituted Chairs of Environmental Archaeology. And it was at the suggestion of Prof. F.E. Zeuner that the Deccan College instituted a Lecturership in this subject. Later a similar step was taken by the M.S. University of Baroda. About the same time the Tata Institute of Fundamental Research was started at Bombay. Now it has bifurcated its activities, and some aspects are being studied in the Physical Research Laboratory at Ahmedabad.

These institutions have embarkeed on various aspects of the past, particularly climatic conditions in Gujarat, Maharashtra, Madhya Pradesh, Rajasthan, Andhra Pradesh, Karnataka, pertaining to various aspects of the Stone Ages, and the later Chalcolithic period.

In Sind, and Western Punjab, Raikes initiated hydrological investigations for ascertaining the climatic conditions which brought about the fall of the Indus Civilization. These investigations, though not conclusive, do suggest that there was not one cause for the disappearance of the civilization. While in the Punjab, it might be some sort of foreign invasion, in Sind, it might be the sudden uplift of the land.

Observation of the numerous river sections all over India by myself and a my colleagues, Dr. R.V. Joshi and Dr. S.N. Rajaguru, points only to the one and only one conclusion that unlike Europe, and America there were no marked climatic changes during the Pleistocence, in which Early Man appeared and progressed gradually to a higher economic and industrial stage. Even during the next phase known as the Mesolithic, the primitive man made microliths and eked out a living in an environment which was not necessarily very dry, as previously believed. This is particularly true of regions like Andhra Pradesh, Karnataka, North and Central Gujarat, as well as Rajasthan.

How, by what means and methods these environmental studies are carrid out is briefly reviewed by one of my colleagues, Dr. S.N. Rajaguru.

The foundation for environmental studies in India was laid down by Robert Bruce Foote and de Terra, who produced a classical work on the glacial-interglacial episodes of the Quaternary history in northwest India, Later on, Zeuner gave a solid environmental framework for western India. All these pioneers were basically geologists and were trying to integrate climatic framework of the Indian subcontinent with the classical Alpine glacial—interglacial phases of Europe. Zeuner correctly showed that there was no pluvial period in western India, when Europe was experiencing glacial cold. Zeuner introduced the study of fossil or buried soils discovered in the older alluvial deposits of north Gujarat.

Departments of Environmental Archaeology

After the establishment of separate departments of environment archaeology at the Deccan College, Pune, and the M.S. University of Baroda some 20 years ago a good deal of new data have been obtained on palaeo-environment in western and central India for the last 200,000 years. Though geology and geomorphology continue to dominate the field of environmental studies, gradually biological sciences are also playing an important role. New sophisticated laboratory techniques, involving the use of mass spectrograph, X-ray diffractometer and the scanning electron microscope, are being employed at the Physical Research Laboratory, Ahmedabad, for understanding the environment of Early Man. As in the past, British scientists continue to take interest in the Indian problems and recent researches of Cambridge and Oxford groups have certainly given a new dimension of palaeo-environmental studies in western India, particularly in Central Rajasthan aud Central Gujarat.

A few selected examples of researches carried out in different parts of India in the last 20 years will show the trend in environmental studies in India.

Palaeotonlogy and Palaeobotony

Though a large number of mammalian fossil bones have been found in association with palaeolithic tools occurring in the older alluvial deposits in different parts of India it has not been possible to interpret past climates precisely, owing to the wide adaptability of large animals like cattle, deer and elephant. However, a few animals, having less adaptability to changing environment, have thrown some light on local ecology. The occurrence of hippopotamus in the Ghod Valley, Taluka Sirur, District Pune, sug-

gested local marshy pool environment, during the late Pleistocence (about 20,000 years B.C.) and the presence of rhinoceros during Upper Palaeolithic times in Kurnool area probably indicate thicker forest cover in the present shrubby area. Likewise the discovery of ostrich shells at Pune, Patne (Jalgaon District) and at Bhopal might indicate a drier phase during the late Pleistocene

Palynological studies of soils and sediments associated with archaeological materials from different parts of peninsular India have not produced substantial results owing to the poor preservation of pollens in oxidizing environment. The only major recent contribution is that of Gurdip Singh who worked on pollens from the lake sediments of western Rajasthan. These studies showed that the climate was distinctly arid during the closing phase of the Pleistocence (—20,00-100,000 yrs B.P.) and became relatively wet during the early and mid-Holocene (—10,000 to 3,000 yrs B.P.). Radiometric and palynological investigations of lake sediments at Tosh-Maidan in Kashmir Valley have indicated that the deglaciation in north-west India started by about 15,000 yrs B.P.

Geology and Geomorphology

(*a*) *Terraces and valley morphology* : Investigations in the Liddar valley, Kashmir and in the Markanda valley in Himachal Pradesh have shown that the concept of classical four glaciations needs complete revision in the Indian context. There is no convincing evidence of Pleistocene glaciation below 2000 m, anywhere in the region. Early Man arrived in Kashmir Valley just prior to the beginning of icy cold in the area, probably in the early mid-Pleistocene. It is this major climatic event that is recorded in the form of boulder conglomerate in the foothill zone of the entire west-east length of the Himalayas. Cut and fill and erosional terraces observed in the sub-Himalayan area are post-Boulder Conglomerate in age or belong to the later Pleistocene period. Strong tectonic movements coupled with cold warm climatic cycles were mainly responsible for the formation of these terraces.

On the other hand, cut and fill terraces of the Peninsular rivers have formed mainly because of climatic changes coupled with mild epeorogenic (tectonic) movements. Terrace deposits have yielded abundant Stone Age tools ranging in age from late mid-Pleistocence to the end of late Pleistocene. It is these terraces which have been studied in great detail by archaeologists and geologists during the last 30 years.

(b) *Sedimentology of Fluvial Deposits*: Bouldery, pebbly conglomerates and gravels occur mostly as ancient gravel bars deposited by braided and slightly meandering courses in the upper and middle reaches of many rivers. The occurrence of such deposits in the middle reaches of the Krishna and the Godavari in Maharashtra and Karnataka indicate higher competency of these streams during the later Pleistocene when the region was occupied by Acheulian man. Detailed geomorphic investigations of these older gravels, occurring 5 to 25 m, above the modern bed level of the Krishna and its tributaries the Bhima and Tungabhadra in northern Karnataka have shown that the drainage was disorganised, braided and shallow. The Acheulian man was camping on the banks of such channels at Hunsgi and Anagwadi.

Hydro-geological experiments carried out in the modern bed of the Mutha near Pune have thrown considerable light on the nature of movement of boulders and pebbles during the monsoon floods. It has been observed that such a movement is extremely slow, scores of metres in a century. In some of the plateau rivers in the Deccan this movement was probably still slower. It is this relative stability of plateau streams which is responsible for the preservation of large number of fresh tools in the modern as well as in the ancient gravels. The occurrence of bouldery/pebbly gravel beds right on the coast near Bhavnagar in Gujarat and near Prakasham in Andhra Pradesh also help to postulate changes in sea-level during the Quaternary.

(c) *Geochemistry and mineralogy of finer sediments* : Clay mineral studies of reddish alluvial silts around Pune showed that there is a relatively higher proportion of kaolinite type of clays in these deposits. It is, therefore, suggested that the rainfall at Pune was higher by about 40% some 30-40,000 years B.P. Deposits belonging to the later periods are found to be poor on kaolinite and rich in montmorillonite, a clay mineral characteristic of semi-arid soils developed on basaltic rocks. Similar clay mineralogical studies of stone tool-bearing rubble soils from the rock shelter of Bhimbetka indicated that the area was experiencing sub-humid forested environment throughout the late Pleistocene.

(d) *Pedology* : Laterite, a brick-like iron/alumina rich rock, occurs in humid parts of India today. The presence of this rock in the late Tertiary/early Pleistocene context in the semi-arid parts of northern Deccan and western India suggests that the monsoonal activity was stronger and persistent in this part of India, just prior to the arrival of Early Man in the region.

Rotlehm type of non-calcareous reddish soil developed on fossil dunes in western Rajasthan indicates sub-humid climate in the present dry zone of Rajasthan some 30-40,000 years B.P.

Comparative study of buried black soils occurring in association with Chalcolithic and Early historic settlements in Maharashtra showed that the region was better forested during Chalcolithic times than in the later periods. Human interference with natural vegetation was mainly responsible in creating these conditions. Sub-recent alluviation found in most of the streams in Maharashtra is also due to anthropogenic factor.

(e) *Aerial photography and geomorphological features* : Aerial photographs have revealed the existence of well-integrated drainage system in the Luni valley of western Rajasthan, during the late Pleistocene. (This had been suggested earlier by the discovery of Middle Palaeolithic tools). This observation is confirmed by the presence of well-rounded sandy pebbly conglomerates in the Luni valley. At present the Luni is disorganised and choked by aeolian sands at a number of places and transports only sands.

Presence of fossil dunes near Baroda and Jaipur clearly shows that the present sub-Humid parts of western India were experiencing very dry climate during the terminal Pleistocene (20,000-10,000 years B.P.).

Recent investigations carried out in Saurashtra and Konkan (coastal Maharashtra) with the help of latest techniques like aerial photography, scanning electron micro-

scopy and radiometric dating have proved beyond doubt that the coastal strip of western India experienced several changes in sea-level during the Quaternary. These studies have helped to place the antiquity of Early Man in Saurashtra to about 200,000 years B.P. or to the mid-Pleistocene.

These examples clearly establish the fact that the monsoonal India had also been affected by the climatic changes during the Quaternary. The exact nature of these changes is not yet clear due to lack of precise dates and also due to the complex nature of geomorphological and pedological processes operating in the hot monsoonal land. We have also to revise our ideas in the light of recent data on palaeoclimatic changes in other parts of the world. Classical Alpine glacial/interglacial sequence has already lost its place in the modern research in Europe and America. It is, therefore, necessary to establish glacial events of the Himalayas independently and then try a correlation with well-dated climatic phases of the Peninsular India.

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New Archalology

As I have said earlier, there is a pressing need for our archaeologists, both in the Universities, Research Institutes and the Archaeological Survey of India, to do more than donkey's work, viz. dig, collect and describe; and put the data in space-time context, stratigraphically and by C-14 determinations. Something more about the technique, social organization, contacts by trade, etc., is expected. This is natural. But, for such a more illuminating or interpretative "report" or writing, two things are essential. First, the excavation should be horizontal to some extent, so that the relationship of the various objects can be noted. Secondly, the excavator (preferably) himself should be present at such an excavation, and collect the data, and test the date by "feed-back", that is, raise questions and try to answer (or get answers) on the spot. Of course, the excavator has to be an anthropologist, and not an excavator of the old type (even Wheelerian type will not do).

If all these conditions are fulfilled, even partially, the excavator must be lucky enough to find such evidence.

Only two or three examples are here given to show what the New Archaeology can and cannot do.

Many of our Chalcolithic sites like Nevasa, Inamgaon and Navdatoli yield literally hundreds of blades, cores and chips of chalcedony, and occasionally of quartz, carnelian, and jasper. Initially we used to classify these only typologically. Subba Rao went a step further and worked out the method by which the cores and blades were made. Later I worked out the function of the blades and also the socio-economic significance of these blades by studying the vast collection contextually, horizontally and vertically.

In the vast collection there were a few comparatively thin, fully worked cores, with a blunt tapering point.[1] These were separately grouped, but I could not be specific about the function of these thick-ended points.

This was finally determined when in the excavation of Shahr-i-Sokhta, a site in Iranian Sistan, these drills were found along with beads.[2]

That these micro-drills were used for cutting and drilling lapis lazuli, turquoise and other semi-precious stones, was not only confirmed but the entire equipment—cores of jasper, convex scraper, drill-heads, chips, a large sandstone quern (grinder), and eight small blocks of chalcedony were found buried, as grave furniture, by the feet of an adult man. (See Fig. 55-56)

Now, here is evidence that not only these micro-drills were used for drilling holes in beads, but that as early as 2400-2300 B.C. technological specialization had begun, otherwise there is no sense in depositing such goods in a grave.[3]

Probably such specialization existed in our Chalcolithic sites. Unfortunately we rarely come across such burials. Even at Shahr-i-Sokhta it is perhaps exceptional.

At Inamgaon we find burials, in almost every house. Now, if among the

1 Santolia, H.D. *et al Chalcolithic Navdatoli* Poona, 1971, pp. 242-71.

2 Piperno, M, "Micro drilling at Shahr-i-Sokhta; the making and use of lithic Drill heads", *South Asian Archaeology*, London 1973, pp. 119-29.

3 Piperno, Marcello, "Grave 77 at Shahr-i-Sokhta . . .", *East and West*, Vol. 26, 1976, pp. 9-12, Fig. 2-6.

finds of microlithic blades, we can isolate the drills as belonging to a particular house or houses, we shall be justified in calling this the house of a bead-maker !

Such perfect or near-perfect examples are rare, but have become possible because of the emphasis on the study of cultural variables or variability.

As I have said, this is not altogether a new approach. For I have employed it as far back as 1936 in my study of temples of Gujarat. Only the Americans have made this approach into a general theory.

Kushana Graves

Advocates of New Archaeology are ever anxious to formulate its general laws or principles. They are not satisfied with a mere description of the archaeological finds from an excavation—whether it be a habitation site or a cemetery. However, when they are faced with the actual things, the limitations of this approach become obvious.

This is well illustrated by the article of J.G. Shaffer and M.A. Hoffman.[4]

On the site called "Said Qala Tepe", 25 km. west of Kandahar city in south-western Afghanistan, they discovered a prehistoric mound. While a small vertical excavation proved it to be coeval with the Indus civilization, a cemetery among its debris was found to be of the Early Historical Period—specifically Kushano—Sasanian. How many graves the cemetery contains is not mentioned, but 35 graves were excavated.

These were of three principal types : simple trench, slit trench, and bench. With each principal category several variations in the nature of grave fill or super-structure were noticed.

The graves could also be grouped according to the location or spatial dimension. However, grave goods were found only with four burials, and among these only those with Burial 29 were helpful in establishing cultural affiliations.

Very careful excavation indicated body orientation, and when this was related to grave types, some inferences could be made about the social status of the buried persons.

However, the authors say very plainly that the rules which they might deduce regarding the society as a whole (as represented by all the burials recovered in the excavations) were perforce general and incomplete, because they were dealing with an unknown segment of the population.

Nevertheless, certain inferences have been made. The first inference that every member of society, regardless of age or sex, must be buried. Families (regardless of social definition) should be buried together. Between the ages of 1.5-2 and 6 years individuals achieved sufficient social standing to merit full burial. In brief, the family determined the particular style of grave, orientation and position of the body, and the inclusion of burial goods.

4 "Kinship and Burial among Kushano-Sasanians : A Preliminary Assessment'" *East and West*, Vol. 26, (1976), pp. 133-150.

"All these inferences were made possible because all the details were not *only noted on the spot, but studied from various points of view*, noting particularly the *cultural variables*."

As said at the outset, all this was made possible because the sample was fairly large. More important, the excavators were not only good, careful diggers, but scholars—anthropoligists, physical and cultural—fully aware of what was expected of them, and what the site expected from them.

How can we profit from this work ? So far, I have not come across a cemetery either at Langhnaj, Nevasa or at Inamgaon.

At the last mentioned place, we find only single burials, either for a child or an adult, in the floor of the house. Hence we can do nothing more than noting the position of the body (in the case of the adult) and the quality of the grave goods, and, for the matter of that, the variational aspects.

When some three years ago, a person was found buried in a sitting posture with some grave goods, the reasons were immediately sought for in the house under excavation.

However, in future, if more than one or several burials are found in a house, or house complex, then Jim Shafter's model can be followed.

In a site like Langhnaj, we do not know when a skeleton will turn up, because there is nothing like a grave pit, or if it be there, we have failed to distinguish it so far. However, if a large area is dug horizontally and if several skeletons turn up below 4 feet at the same floor level, then deductions, as made at Said Qala Tepe, might be made.

But of all the sites—prehistoric, proto-historic and historical—the best opportunity of understanding the social structure might be afforded by cemeteries in a Harappan site like those at Lothal and Kalibangan.

Improvements in Potassium-Argon Dating

"Since its development in the 1950s, potassium-argon dating has seen several modifications. The original method of measuring the total potassium and the three isotopes of argon in a sample, then multiplying it by factors to determine the amount of potassium-40 and the amount of radiogenic argon in the sample, is still in use, and is known as the conventional K/Ar method. Modifications to the coventional method have been, by and large, in improved instrumentation and automation of the procedure, the data being handled directly by means of computerization.

Beginning in 1962, a method of potassium-argon dating, involving neutron activation of the sample with fast neutrons to produce argon-39 from the potassium-39, was developed and is known as the $^{40}Ar/^{39}Ar$ method. A sample of known age and potassium content is activated at the same time as the unknown and used to calibrate the neutron flux and the age of the unknown. The method obviates the need for separate potassium determinations and permits multiple age determinations on a single sample by incremental heating during the argon extraction, thus yielding more information about the sample and greater precision in the age determination than in

the conventional method. Multiple mineral age determinations on a single sample by either method, however, are preferable to a single determination, no matter how precise, as is illustrated by the difficulties encountered in dating the hominid-bearing beds at East Rudolf, Kenya."[4]

Archaeomagnetism

Considerable improvements have been made during the last decade or so in the theoretical understanding of the processes of magnetization, particularly in rocks, and in the instrumentation for measuring and isolating their magnetization. The application of this knowledge to archaeological materials[5] is now leading to an improved system of archaeomagnetic dating, although it must be emphasized that the point has not yet been reached when these techniques can be applied universally or with high reliability. Nonetheless, a much wider range of archaeological materials can now be examined successfully and very precise geomagnetic time-scales can be expected, for certain areas of the world, within the next decade. In order to consider this progress, it is necessary first to review, briefly, the processes by which materials of archaeological interest may become magnetized, then to consider ways in which the magnetization associated with some specific event can be isolated. The construction of a precisely-dated time-scale for geomagnetic changes is then discussed before considering the present status of archaeomagnetic dating in the light of these considerations.

New methods of dating fossil bones

During the last few years, a new method of dating fossil bones using amino acid racemization has been developed. The method has an effective dating range beginning at a few thousand years B.P. and extending to several hundred thousand years B.P., the actual range dependent upon the general temperature of the region where the bone was found. Only a few grams of bone are required for a racemization analysis.

Amino acid racemization dating provides a valuable chronological tool in studying the evolution and migration of modern man. An example of this application is the recently published aspartic acid racemization of ages of several Californian paleo-indian skeletons. These dates suggest that man was present in North America at least 50,000 years B.P. and, therefore, refute the generally accepted theory that man first populated North America only 15,000 to 25,000 years ago.

Racemization dating is based on the fact that the amino acids which make collagen, the fibrous protein, which accounts for 90-95% of the organic material in bones, consist only of the L-enantiomers. However, over long periods of geological time, the L-amino acids undergo slow racemization, producing the corresponding D-amino acids.

4 Curties, Garniss H., "Improvemements in Potassium-Argon Dating : 1962-1975", *World Archaeology*, Vol. 7, 1975, p. 208-209.

5 Tarling, D.H., "Archaeomagnetism : the dating of archaeological materials by their magnetic properties", *World Archaeology*, Vol. 7, 1975, p. 185.

Fossil bones have been found to contain both L-and D-amino acids, and the D/L amino acid ratio increases with the age of the sample.

Since racemization is a chemical reaction, it is inherently temperature-sensitive. Thus in order to date a bone using racemization, it is necessary to evaluate the average temperature to which the bone has been exposed. It is possible to roughly estimate this temperature from pollen profiles or other general climatic indicators. However, this temperature evaluation can be eliminated, using a procedure in which the *in situ* rate of amino acid racemization for a particular site is calculated by measuring the extent of racemization in a radiocarbon-dated bone. After this 'calibration' has been carried out, other bones from the general area can be dated, based on their extent of amino acid racemization. Ages, determined by using this procedure, have been shown to be in close agreement with radiocarbon ages.

Because of the longer half-life for aspartic acid racemization compared to the decay rate of radiocarbon, racemization can be used to date bones which are too old for C^{14} dating. Also, since only a few grams of bone are required for a D/L aspartic acid determination, skeletal remains which are available in insuffiicient quantities for C^{14} dating can be dated, based on their extent of racemization.[6]

The application of this method should be useful in dating the skeletons from the Belan Valley, and elsewhere where no other data is available. Particularly important is the fact that with this method we can directly date the skeleton in question.

Awareness

When on the one hand there has been a great desire on the part of the educated masses to know more and more about our past, yet there is also the most deplorable attempt to disfigure our monuments, while trying to steal this or that figure from the numerous monuments spread over the length and breadth of India. One's heart cries out when one sees photos of such figures month after month. Formerly, during or under the British rule, sculptures were no doubt stolen, even officially transported to Europe or America, but I do not think they were ever disfigured, as they are today !

Vandalism (See Fig. 56A)

This is rank vandalism. It is all the more deplorable, because it is the result of international gangsterism—desire on the part of foreign museums to enrich their show-rooms with this or that figure of this or that period in Indian history. Of course, our own people are also responsible ; they are a party to this loot and are the actual perpetrators of this most heinous crime against posterity. For, at this rate no Indian monument will be worth looking at. We shall have to be content with seeing their photos in books.

6 Bada Jeffrey L. and Helfman, Patricia Masters, "Amino acid racemization dating of fossil bones", *World Archeology*, Vol. 7, 1975, p. 160-61.

Publications

It is in this sense that we should welcome the publication or republication of the numerous books on art and archaeology. No doubt many of the publications are extremely expensive, and beyond the reach of scholars and many libraries. Still it is these books which will tell the future generations what our artistic heritage was!

However, we should not rest complacent with this defeatist attitude. We should make our people aware, at all levels—rich, poor, educated, illiterate—what our responsibility is towards the past and future.

The (new) mass communication media have not been used from this point of view, as they should be. The Radio and T.V. should have a short feature every week in all languages illustrating the harm that this vandalism is causing due to public indifference and deliberate looting by foreign museums.

At the same time similar short features should relate in simple language the significance of our rich archaeological heritage. If properly planned all these features could be published in all languages. These can well form illustrated brochures for our children.

Conclusion

So in the year 1978 archaeology in India may be said to have made some progress—progress in the field of discovering a new old facts of life, in the interpretation of existing old things, and in trying to disseminate this knowledge to people at all levels of the society—rich, poor, educated, semi-educated, illiterate. Still, as shown above, these measures are not only not commensurate with the problems and means, particularly with the expertise that is available in our country.

Preservation

First, regarding conservation and preservation of our rich legacy, which the Archaeological Survey of India has been doing its best to preserve and conserve all the important national monuments under its charge, the same cannot be said of the several States. Barring a few exceptions, too few to be mentioned, the rest have neither the desire to preserve what they have, engaged as they are in their local politice. The result is that the large number of monuments are simply going to dogs.

It is no use holding meeting of the Central Advisory Board of Archaeology and advising the States to do this or that. So-called Directors are helpless. One of the most advanced State had no trained Director for several years. And all archaeological activities had practically stopped. Likewise another big state is in a similar condition.

How to activate these States is really a problem. The endemic shortage of fund is accentuated by the indifference of the rulers (State Ministers), and both these help in making the persons in charge of the Department completely frustrated.

When this is the condition about preservation of existing monuments, one cannot

think of the discovery of the unknown. If anything is discovered, it is just by chance. Thus there is a precipitious fall—decrease in the conditions obtaining before 1947, and today. At that time States like Baroda and Mysore did excellent work.

Even the Centre can do much better—both in preservation/conservation and exploration, and excavatton if the public cooperates with its activities. Particularly, this is desirable in the conservation and protection of monuments.

How this can be done I have discussed at length elsewhere.

The same is true about new discoveries. Both exploration and excavation can be more intelligently planned and executed and even speedily reported if the things are taken care of at every stage. On the scientific and side, things could also, much more and contributes to our general knowledge, if again such things are planned cooperatively. We are still ignorant about the way how the Indus Culture spread in all the directions.

What is needed is the adoption of the latest methods of research.

As far as research is concerned we might give here a "Blue Print," taking into consideration the main problems, the available facilities and personnel in India. Any "blue print" or a plan has to be on regional basis. Whether it be in India, Europe or America, an archaeological team should have not only a trained excavator, draftsman and photographer—surveyor, but also an anthropologist, botanist, and a chemist. The latter four and others form what is called the "supporting staff." Very few Universities and research institutions can have all these, as well as the laboratories required for study, say for identification of animal bones or charred grains found in an excavation.

However, each University or the Colleges within its jurisdiction has Departments of Zoology, Botany, Physics, and Chemistry. The Departments either in the University proper, or affiliating Colleges could in strengthened by adding a small research unit which is specifically archaeologically oriented.

The archaeologists will have to have the modern outlook. It is not enough that he has undergone the Wheeler ian school of stratification. He will have to acquire or learn many of the method and techniques, and bear in mind the goals of New Archaeology."[7]

We should have at least four to six well-equipped centres in India : one or two in South India, one for western India, including Gujarat, Maharashtra and Rajasthan ; one for M.P., one for U.P., Bihar and Orissa; one for north-eastern India, including Assam, Meghalaya, Arunachal, etc., and another for Haryana, Panjab and Kashmir.

The supporting staff in each centre will have to be on the move, as and when required, from each sub-centre to another, gathering and processing information.

The success of this interdisciplinary plans of work will to a great extent depend upon the spirit of cooperation and accommodation shown by each member of the team as well as the person who heads such work. Much will depend upon his personality.

7 See Sankalia, H.D., *New Archaeology: its scope and Application in India*, Lucknow, 1977.

Human nature being as it is it will be too optimistic to expect cent per cent success. But if 50 per cent of the goals are reached, then we should be satisfied.

What should each centre do ? The main goal is clear enough, whether it is a big excavation or small; whether the problem is of local or regional importance, or of all-India importance, it should receive full attention, should be studied from multi-disciplinary point of view.

Keeping this in view, only the major problems of all India importance are here mentioned. And that too those which involve field and team work. As I have said so often, and recently in an article in the *Times of India* we have absolutely no idea of town or city life of so called historical period—Early, Middle or Late, though for the last mentioned we might find some description in the accounts of travellers.

Thus we have no idea what Mathura was in the Kusana period or Kausambi and Pataliputra were in the Gupta period, or Kanyakubja (Kanouj) was during Harsha's rule.

The same may be said of Ujjain, Maheshwar, and some others in Madhya Pradesh, or Ter, Bhokardhan, Kolhapur, Nasik in Maharashtra. Similarly city sites can be found in Andhra, Karnataka and Tamil Nadu, as well as in Bihar and Orissa, and even in Assam proper (already Gauhati has given some glimpse of it).

While it is not practical nor advisable to excavate the whole or a large part of these city sites, what is here suggested or in view is excavation of that much portion which will give some idea of

(a) town planning—main roads and lanes,
(b) large or small houses, with some idea of the use of each room.
(c) Pattern of subsistence.

The plan should not be very rigid. It should be flexible enough so that enough attention can be given to the main problems in view, viz. life of the people at all levels.

PART V

Blue-Print

A BLUE-PRINT FOR ARCHAEOLOGY

Thirty-eight years ago I had in my Presidential Address to the Lucknow Session of the AIOC spoken on "Archaeology and Indian Universities." At that time Dr. Mortimer Wheeler had given us a *mantra*: "have a problem." He also taught us the significance of pottery and stratification and had drawn our attention to the great significance of Roman contact with India.

Having all this in my mind and taking into consideration the interest which the Universities began to take in field archaeology, I had prepared that "Address". It was a plan, but suitable to those times and conditions.

Now many of these problems are solved. Numerous vertical excavations all over India have given us a fairly reliable chronology or "Time Tables of Cultures".

Stone Ages

We have established the existence of a long and rich Stone Age, divisible into Lower, Middle and Upper Palaeolithic. The existence of a true Mesolithic and the Neolithic and Chalcolithic is no longer in doubt. We also know that these cultures were followed by the Ochre Coloured Pottery and the Painted Grey Ware Cultures in the north, while the Megalithic Cultures characterized by a Black-and-Red Ware and three or four kinds of burials flourished not only in South India, but even in Vidarbha, possibly in Western Maharashtra, as well as in eastern M.P., and south eastern U.P. and Kashmir.

It was against this background that the towns and cities—*again* grew-up in our

present knowledge—throughout India. With these developed the religious architecture—Stupas and Temples, and the associated art.

Towns and Cities

Though we read of grand descriptions of cities— for instance, Ayodhya, Kishkindha and Lanka in the Ramayana and Dwarka in the Mahabharata, what do we know of these cities—whether they be of Mauryas, Sungas, Satavahanas, Chalukyas, Rashtrakutas or the Yadavas ? Next to nothing. No attempt has been made during the last 100 years to know the layout and the life of the people at various levels, of any of these cities. What do we know of the Golden Age—the Gupta Age, except some sculptures and terracottas ?

Development of Temples

During the last 20 years ruins of several early temples have been found, whether apsidal—as many were—of the Nagas, Skanda or Visnu,—or rectangular,—what were the sociological, political, and cultural factors which made the Guptas and their successors to enlarge them ?

As far the towns are concerned, what Marshall did at Taxila, particularly at Sirkap and Spooner at Nalanda should now be attempted at Kausambi, at Mandsor, Ter, Bhokardan, Nasik, Aihole, Badami, Kandhar and Deogiri.

There must be many more sites in Andhra, Karnataka, Gujarat, M.P. and U.P.

Hastinapur

Likewise a well organized and sustained effort must be made to excavate Hastinapur, because it appears we have really no large PGW site. How large Bhagawanpura is, I do not know. But it is essential that a large and significant sector of PGW level at Hastinapur is laid bare before we continue to cherish the 25 year old theory based on most insufficient evidence. It will be good if the ASI can invite the Universities of Panjab, Kurukshetra and U.P. in this venture to cooperate.

Similar planned excavations have to be undertaken for understanding the full significance of the OCP cultures.

Contextual Excavation

What do we expect to know from these excavations ? The aim should be to ascertain whether the site excavated was a village or town, and how the people—rich and poor —lived. For such a knowledge a mere collection of pottery fabrics is not sufficient. The excavations have to be contextual. *The excavator* and his *colleagues have to know the position of each object, particularly the pottery* vessels at *the end of each* day and *think* about *their significance.* Just one illustration will explain.

Many of us might recall the large S. shaped vase with painted decoration all over from Mohenjodaro, Lothal and other sites. The question is, where was this vessel kept ? in the kitchen or elsewhere ? we can ascertain this fact only if we know how

many sherds of this vessel were found and *where* ? If the sherds or the vessel is not found in the kitchen, but only elsewhere, we reach the important conclusion that the Harappans used this vessel as a decorative piece in their houses. At present we cannot say this for lack of definitive evidence from any of the excavated sites, be it Mohenjodaro, Lothal or Kalibangan.

Anthropology

Such functional interpretation is possible with personal supervision, an awareness, and a desire to know, and share of knowledge.Since no excavator, however brilliant, can be omniscient, he must seek assistance of his colleagues—anthropologists and ethnologists, scholars who have been trained to understand the life of the living, or he—the excavator himself must become an anthropologist and ethnologist. All these years archaeology, particularly historic and protohistoric, has been the preserve of Orientalists—of students of Sanskrit and ancient Indian history.

There was nothing wrong in this development, but now this view has to be broadened. Out Faculties of AIC., and Archaeology and AIH have to be expanded to include an anthropologist at the postgraduate level, or we should establish a link with the departments of Anthropology and Sociology.

Links with Sciences

Similar liasion is also necessary with the Science Departments in our Universities —not only geology, physics and chemistry, but even botany. I know this is easier said than done. For cooperation is a "dirty" word. It means "no-cooperation." The ASI has a bureaucratic outlook. It does not regard archaeology as an academic discipline, but more as a Government monopoly. Naturally this attitude has moulded the attitude of some Universities. So I am not sure how these remarks will be interpreted. But one thing is certain that, if we—India—have to emerge from this "childhood" or the state of "FORAGING and Food—GATHERING in ARCHAELOGY" and claim equality with the developed nations of the west than archaeology in India, including the Archaeological Survey of India, State Departments of Archaeology and the University Deptt. have to be not only science—but man—or people-oriented; that is we have to try to understand the life of the people, in the past, at all levels; and not go on playing with pottery and stratification, as taught by Wheeler 30 years ago.

Megaliths—Dravidians and Scythians

From the consideration of towns I pass on to that of megaliths. These have been found, all over India, from Kashmir to Kanyakumari. It is of no use opening one or two in Andhra, Karnataka or U.P. Each type and sub-type of the megalith has to be mapped districtwise, as done by Dr. Sundara, and such numbers should be opened as can be fully studied from the archaeological, ethnographical and scientific point of view. Further, habitation sites of the megalithic people have to be systematically

searched and a few excavated, as mentioned here. Then only we shall know whether the movement of these people is from :

(i) south to north, or
(ii) northwest to the west coast,

and up again to the north to Vidarbha, for instance, with an overflow to U.P. On the understanding of this movement are dependent the further identification of these people with Dravidians or Scythians.

Iron—whence and how

Even the occurrence of iron needs to be solved more scientifically by co-relating the occurence of iron from each group of megaliths with the nearest iron deposit. Unless this is done, in space and time, mere plotting of a few C-14 dates on a map will not help to solve the problem.

U.P. megaliths

The problem of the megaliths in southeast U.P. is more complicated. Here the work already done indicates that these megaliths vary not only in type and contents, but these extend in time from the Chalcolithic to the Early Iron Age.

To whom do these U.P. megaliths belong ? To the *adivasis* of these sparsely populated regions or to the overflow of the more advanced population from the towns of U.P. and M.P. ?

Kashmir megaliths

Very little has been published about the Kashmir megaliths. But, as in the south, these succeed the Neolithic Culture—at least at Burzahom and Gurf Kral. Both these sites present an excellent opportunity for a multi-disciplinary excavation and study, for instance what Professor Grahame Clark did at Starr Car, Yorkshire in England. Unfortunately, as usual, even a report has not been published about this most promising Neolithic site at Burzahom.

I have seen it twice and studied and photographed all the most important finds. This study indicates that the Kashmir Neolithic had relations with China on the one hand, and Iran on the other. What was the impact of this contact on Kashmir history in particular and India's history in general ?

These important questions cannot be answered by a simple excavation. A competent and devoted team of workers, as here explained, can do justice to a site like this.

Ganga Chalcolithic Culture

That the Ganga Valley was not devoid of this sort of Neolithic and Chalcolithic Cultures has been amply proved by excavations at Chirand, Sonpur and Oriup.

These or their later off-shoots had spread westwards upto Koldihwa and other sites on the Belan.

The most important question here is about the authors of the culture. It is certainly pre-Aryan, and of the earliest rice-eaters in India—and rice—I may mention, does not occur in the *Rigveda* or the *Avesta*, as my friends Dr. Kanga and Prof. Mehendale have ascertained. If not the Aryans, who could these people be? Can we identify them with any of the *adivasis* of the region today?

You will see what a deep and sound knowledge of anthropology as well as a full understanding of the archaeological data is necessary for answering these questions.

Neolithic—S. India

When we turn from these newly discovered Neolithic sites to the traditional home of the Neolithic in Andhra, Karnataka and Tamil Nadu, sites like Tekkalkota have to be more fully excavated and studied as mentioned here.

Navdatoli and Inamgaon

For a fuller understanding of the Chalcolithic, whether it be in Punjab, Haryana, Rajasthan, M.P., Gujarat, or Karnataka, I cannot but draw attention to the work we did at Navdatoli, some 20 years ago, and what we are doing at Inamgaon for the past seven years.

At the very outset I had ruled out the Survey tradition initiated by Wheeler of a trench across the mound. The excavation had to be horizontal exposing each feature, —*chula*, silo, houses, carefully and keeping the finds separately, not layerwise and trenchwise but housewise. I had explained to each member of the team in a special lecture before excavation that every piece of bone had to be carefully collected and its position noted. "How would this help", one may ask? Such a careful observation would show what the members of *each* house ate, and in conjunction with the number of pots and pans found in each house, we might have some idea of the unit of the family.

Beef—eating?

Excavation in this way at Kausambi in the Ghositarama area, for instance, would tell us what the residents of that monastery ate. If by chance animal bones are found, and these are identified as those of a cow/ox, then this one fact might support the statement of Hiuen Tsiang that the Buddhist Bhikshus had no objection to eating beef!

At Inamgaon our botanist, Shri Kajale has studied the recent flora as well as the evidence from charred grains. Likewise a surgeon, Dr. Bodhe is studying the prevalence of diseases in the excavated skeletons.

These—skeletons—whether—they be from Mohenjodaro, Harappa, Lothal, Kalibangan, from Burzahom, or rock-shelters from U.P., have to be studied within a reasonable time. If this cannot be assured, then may I say most reluctantly that we

should allow these rich or poor chaps to lie, where they are ! For we are committing a crime, in neglecting the most important evidence—the man himself !

To revert to Inamgaon, Dr. Badam is studying the animal bones, Dr. Rajaguru has sought to interprete the climatic fluctuations in the region. Thus our most experienced team of excavators, consisting of Dr. Ansari, Dr. Dhavalikar and Shri Rasar and Shri Padwal, is trying to extract as much knowledge about man and his environment 3500 years ago.

Such science-oriented studies are also now necessary in purely prehistoric field. We have to pass on from the collecting state to that of civilization. Not only the vast collections of stone tools, whether it be at Poona or Nagpur, Allahabad or Varanasi, Calcutta, Sagar or Ujjain, Waltair or Madras, Dharwar or Mysore have to be classified according to the traditional methods, but new so-called objective or scientific techniques should also be adopted. More than that attempts have to be made to understand the function of tools by using them for various assumed purposes. And above all, the search should now be confined to primary sites or camp-sites, and efforts made to understand the environment under which man lived. In such a study, a multi-disciplinery study of the modern environment has been found to be extremely helpful. This is best done with the help of botanists and pleistocene geologists. By way of illustration I might mention how we tackled the initial discoveries at Rojadi near Rajkot, at Somnath, at Patne, District Jalgaon, and at Hunsgi, District Gulbarga, besides Sangankal, Tekkalkota and Pahalgam in Kashmir.

Any discovery, whether it be of palaeoliths or pottery has to be put on a solid, scientific foundation. Once this is done its extent or ramifications have to be understood, again by a systematic, call it military-like planning. Thus having confirmed the all-India existence of the Early and Middle Palaeolithic, we have to see whether the Upper Palaeolithic has similar distribution. Further, is its development indigeneous or caused by ideas or migrations by people from Western Asia ? This requires a planned strategy or approach.

Upper Palaeolithic

At present the best and most reliable occurrence of the Upper Palaeolithic are in the Chittoor and Nellore Districts of Andhra, followed by stratified deposits at Bhimbetka, M.P. and at Patne in Maharastra. These occurrences have to be linked with those in U.P., Orissa, and W. Bengal, Punjab, Rajasthan, Saurashtra and Kutch. Thus we reach the Pakistan border. Here probably the famous Sukkar and Rohri quarries do have an Upper Palaeolithic element. And this may be found in stratified context in Sindh, or W. Punjab near Rawalpindi.[1]

1 This was written in April—May 1978. Afterwards I recieved the book by Dr. (Mrs) Allchin and her colleages. And as anticipated here, they have found *all the three* culturs in Sindh and Rajasthan.

Historical Archaeology

Just as we need planned field studies in prehistory and protohistory, so also in the historic field, besides the horizontal excavation of towns and cities or villages, regular search for fresh or fresh investigation of old sites, such as caves is necessary. It is this kind of planned work that brought to light the Vakataka inscription of Devasena at Hisse Borale, or the inscription of the new Traikutaka kings at Matvan near Ratnagiri, and the earliest Jaina Cava at Pale, near Poona, and most important an inscription of Asoka near Bhopal. Is it not a shame, that the text and the photograph of this inscription is not yet available to students in schools and colleges...?

Fresh Study of old monuments

Even a fresh study of old monuments, such as the Kanheri caves has brought to light inscriptions which provide interesting evidence about 15 Buddhist teachers, some having the name *Sadabhijnana*, and *Jhayi*.

Numismatics

In Numismatics, while discoveries at times throw light on this or that king, what is now necessary is a fresh study of coins of various dynasties from stratified excavations; such an attempt has already been made by Dr. P.L. Gupta about Satavahana coins from Nevasa and Kolhapur. Similar studies should now be undertaken for coins from Purana Quila, Tumain, M.P., Mathura, (Sonkh), Sanghol, Punjab. This chronological sequence should be compared with that reconstructed in the last century by Cunningham and others.

Mediaival Archaeology

Such planned search and study should be extended to Mediaeval and late Mediaeval archaeology. At the Deccan College, our initial work on Maratha Architecture has been followed by a planned search for and intensive study of Maratha Art of Painting. Similar attention could be devoted to the archaeology of Bidar, Golconda, Vijayanagar and Hyderabad, exactly as we did that of Ahmednagar some years ago.

Industrial Archaeology

In fact archaeology knows no bounds. Competent scholars can undertake studies of industrial archaeology as well.

Just as we are anxious that India should take its rightful place among the developed nations of the world, politically and economically, so also in the cultural field—in archaeology—no longer Indians should remain mound-scratchers and grave-diggers or collectors of stone tools, or get enamoured by this or that image, be it in stone, metal or terracotta or painting. Likewise we had enough of pure descriptions of temples and mosques. At every stage and in every case the life of the man behind this or

that object should be our main objective. And in this all-embracing task the archaeologist should seek the help of historians as well as specialists in languages, sociologists and anthropologists, engineers as well as physical sciences.

Naturally this anticipates a radical change in our hundred year outlook, and a re-orientation of the curriculum in schools, colleges and universities. This task also is no doubt formidable, but I may assure you, it is fascinating, provided, of course, we are prepared to leave our "dog in the manger" policy and aim only at the acquisition and dissemination of knowledge.

PART VI

Appendix I

Sciences in the Service of Archaeology

The account or report of one of the finest examples of science-oriented archaeological excavations has just reached my hands. Like the entire text it bears the title in Italian (*La Citta Bruciata Del Deserte Salate*) as well as in Entlish—The Burnt City in the Salt Desert. This has been reviewed in the form of an article because, this is exactly the kind of work we should undertake, execute and publish, as I said in an article in the *Times of India*, some months ago, "Planning for Archaeology". From the moment the site, called Shar-i-Sokhta was discovered in Sistan, a part of eastern Iran today more than 10 years ago, until its excavation was completed, its various aspects were fully studied by historians, and scientists from various fields—geologists, geographers, ethnographers, physical anthropologists, palaeontologists, blood-group experts, palaeo-botanists,—cooperated in re-creating as full a picture of the life and conditions of this earliest city in what is today a desert, more than 5000 years ago.

Discovery

The credit for discovering the site of the city, and subsequently one of the biggest ancient cemeteries in the world goes to Dr. Giuseppe Tucci, the GOM (Grand Old Man) of Italy. Again not only he is responsible for planning the excavation, and execution but its most unusual publication. This is not only artistic, with a large format (29 cm × 20 cm). But the entire report is printed on thick art paper. This has naturally facilitated the printing of no less than 55 coloured plates and a large coloured map of Sistan in no less than 12 colours showing the occurrence of various minerals in relation to the five prehistoric sites in the region. This is again supplemented by a fine morphological map of Sistan, printed on the back of the front and

the rear hard cover.

These maps clearly show that Shahr-i-Sokhta and a few other sites are today situated in a desert. And this is no ordinary desert. Both the heat and the cold are intense. Along with the former, there is a frenzied whirling wind, which even pierces and hollows pottery.

Earlier Exploration

Tucci explored the most inhospitable region for two seasons. After his study of the Indian and Buddhist philosophy he was in search of evidence of the cultural and religious links between Tibet and India. And lo ! he discovered no less than 700 reliefs of Gandhara Art in Swat. While still there, he came upon hundreds of protohistoric graves and dwellings of the Dardic people—an ancient Indo-Aryan invading tribe. The grave furnishings—particularly a grey coloured pottery with numerous goblets (footed cups) indicated contacts with Iran. While this discovery is still being followed up by the Italians and Pakistanis, Tucci jumped over Afghanistan and reached Iranian Sistan. This is ancient Sakasthana, one of the homes of the Scythians—a Central Asian tribe. Why was it so ? Because 2000 years ago and still earlier—5000 years ago—Sistan was known as the granary of Iran. Though today a desert, with a few scattered villages, it once nourished cities.

Burnt City—Tradition

These "cities" had to be searched. Of the many ancient sites the choice fell upon Shahr-i-Sokhta. Traditionally it is known as the "Burnt City". It had been noticed by Sir Aurel Stein, that pioneer explorer of these regions.

In order to understand how the archaeologists working in cooperation with or assisted by several scientists, extracted so many details about the past life and environment, we should have some idea of the country.

Sistan

Sistan is an intermontane basin, about 400 km in length (east-west) and 200 km in width (north-south) and is divisible into the Registan desert in the south-west, and Sistan with it stony deserts in the north-east. These two regions are sharply divided by the Rud-i-Hilmand. Though geologically Sistan depression may be regarded as "closed system", still historically and culturally it was connected with Mesopotamia on the west, and India (Indus Civilization in particular) on the east.

In such a country, people live today, (as in the past, as revealed by pottery-spread) either along the foothill zone of the mountains, or along the river courses and the form of the rivers which approach the terminal lakes.

As the ethnographic survey reveals these people continue to follow the same professions which were followed by their fore-fathers through the millennia. Thus the Saiads are hunters and fishermen. The Gaoders cattle-keeper, the Baluch and Brauhi are sheep—, goat— and camel-herders, and some of them are farmers. Among the

important crops are wheat and barley, besides leguminous plants and forage crops, whereas melons, sorghum and vetch are the main summer crops. Each ethnic or tribal group is economically specialized and needs what is produced by the others. These all live in mud or reed huts.

However, the struggle for existence is constant. There is the dread that the waters of the Helmand might not rise annually, or that the fields once sown might be flooded. And then they have to be prepared for the sudden shifting of the river course, necessitating the re-making of the irrigation channels, or abandoning the settlement. Again the soil has not only to be irrigated but it is also necessary to provide drainage so as to dilute the concentrated salts.

The present landforms are the code which helps us to read and understand the behaviour of the peoples throughout the ages in the land-locked basin.

Superficially sandy beds of the lakes and the Helmand river are found to have a permanent groundwater flow throughout the year.

Explanation of Landforms

Sir Aurel Stein, Dr. Tucci, and several other explorers had seen the peculiar formations in Sistan—deep sandy depressions, and the pediplains at different levels, edged by almost vertical escarpments as well as feel the effect of intense heat and cold as well as the songs of the furious winds, known as "the roaring 120—day"—wind in summer, but none had ventured to explain any of the climatic and topographic features. These were interpreted only in 1970 by two German geologists U. Jux and K.K. Kemph ("Regional Geology of Sistan" in *Prehistoric Sistan* in press) as the result af exogene climatic cycles.

Curiously, the landforms in Sistan may be correlated to the climatic cycles of the Hindukush, that means to the worldwide climatic fluctuations. The so-called terraces or pediplains at different levels can be associated with major and minor climatic fluctuations. The terraces known as the Chahar-Burjak and Ram Rud are said to have been formed during the first two glaciations (Riss and Wurm) with the respective interglacials, whereas the Timruz terrace with the Shahr-i Sokhta delta is associated with the Boreal phase of terminal lakes from 8000 to 6500 B.C. But there was still a flow through the Rud-i Biyaban delta in the west and the Sana Rud north-east of Shahr-i Sokhta and also eastwards through the actual delta. The Atlantic phase of aeolian erosion from 6500 to 3200 B.C. caused a lowering of the basin in the northern part of the depression by about 3m., determined again because of scarce water input. *With the sub-boreal phase of the terminal lakes* (3200-500 B.C.) *which is also the beginning of the early settlements of Shahr-i Sokhta, the Sistan delta system remained semi-stable.*

We can thus understand why in Sistan throughout man's history the permanent settlements were and are to be found in the fossil and actual deltas and along the main branch of the Hilmand and not following the shoreline. Enough ground water is available for men and animals only in the deltas and not in the otherwise shiny blue lakes whose bottoms provide none.

Past Vegetational Pattern

Giovanni De Marco, and Angela Dinelli of two different Botanical Institutes in Rome have tried to reconstruct in detail the prehistoric vegetational pattern, particularly during the period when the city of Shahr-i Sokhta was in existence, by taking into consideration not only the nature of the remains of ropes and mats discovered during the excavation, but also the fact that the roofs of houses at that period were made of wooden poles with a bedding of boughs and clay, and the absence or rarity of such a practice today.

If the poles were of Tamarix, Populus and Salix Woods, then these were either imported, or transported along the river by chance, for they do not fit in with the natural vegetational pattern of the region. Like-wise date palms, fruit trees, and tree used as windbreaks fall under the cultivated group. But grapes and water melons were certainly grown in the region some 5000 years ago, as pips of these were found in the rubbish on the Eastern Residential Area (Fig. 35).

Absolute Dating

The absolute dating in calender years of the different phases was made by radiocarbon testing, palaeomagnetism, and Uranium 238. No less 50 C. 14 dates on fully burnt material-charcoal and half burnt, have been made available by the laboratories at Teheran, University Museum at Philadelphia, and the University of Rome. The other two methods, which are still in a experimental stage, have been attempted by the geophysicists of the Kyoto and Osaka Universities. *The result is a fairly organic chronological pattern.*

Several seasons of excavation, but particularly the one in 1975 has confirmed the impression that the habitation first began on the eastern edge of the terrace. This was about 3200 B C. So far no antecedents of this are known, though these are expected in a region which was quite favourable to plants and animals.

However, no traces of any Stone Age culture have so far been found. The long duration of the earliest habitational phase, as well as natural agencies like wind and rain have built a 4m. (about 12 ft.) thick deposit. It is found to spread over an area of 15 hectares.

Most Important Period

Then came the most prosperous period of the settlement. Not only it expanded physically but there is abundant evidence of prosperity and growth in population due to import of such material as lapis lazuli, turquoise, and sea-shell. These were then locally worked as shown not only by numerous chips, flakes and cores, but by the discovery of an artizan's grave, equipped with his tools, and products. This was a capital discovery, and proves without doubt the technological specialization 5200 years ago. A workshop-cum-residence of such an artizan was found in 1972 on the western outskirts of the settlement. Tiny flakes of flint and lapis lazuli were found stuck in the clay of the floor in room DXIII.

Chronologically and from the nature of the objects found, this earliest phase (I) corresponds with the protodynastic II and III-A in Mesopotamia.

For some reason this trade and industry in lapis lazuli and turquoise waned, and was replaced by an industry in carnelian, alabaster and chlorite.

Then came a devastating fire (end of phase 7). This burnt down the inflammable wooden roofs. Fortunately the burnt collapsed material is well preserved intact under later debris.

However, this destruction by fire does not seem to have hampered the socio-economic development of the city, as no abrupt change in the cultural milieu is visible.

Plan of Houses

Some idea of the individual houses and settlement can be had during Period II. The houses were square in plan and at an average measured 90 and 150 sq.m. Each unit consists of a variable number of square rooms—from 6 to 10, and built entirely of mud bricks—manufactured in special mould (40×20×10 cm.) The houses had a flat roof, made up of Poplar trunks laid parallel, with their end resting on the top of the walls, about 60 cm. apart.

This framework was covered by an uneven layer of Tamarisk branches. On this rested a thatched roof, made of reeds coated on the outside with clay and straw plaster.

Not only a large family lived in such houses, but each room had a definite function. In winter, all the activities were carried out in a room with a central fire place. In one room sat a person fashioning bifacial stone arrow-heads, as the ground was found littered with more than a thousand flint chips.

Food provisions were kept in large jars; found together in a single room. (This practice is not unusual:, we have found such a room at Navdatoli (C. 1200 B.C.), and recently at Inamgaon, near Poona (C. 1200 B.C.) and also at Mandasor in Madhya Pradesh). From this the inference that the food grains were centrally stored is not quite correct, unless a large granary as in the Indus Civilization, is found. For even today, until rationing was introduced, people in India used to store grains for a year or so. However, the provision of a square tank container made of mud bricks is unusual.

Ovens

Food was cooked in ovens. These are horse-shoe-shaped, structures about 50 cm. high, topped by a flat hemispherical vault. The grains—barley and wheat—were ground on an oval-shaped stone, with a spherical pestle or a plano—convex stone.

The doors were rectangular with an a average height of 150 cm. The lintel was supported by wooden planks or boughs. A hinge fixed in the floor close to the door-post was formed of a wooden peg with a hole or a hollow, its sides covered with a straw plaster which was also the floor covering.

The door leaf whether of wood or matting was closed in a very interesting way. Very often they were (found) sealed shut.

A cord, fastened to the leaf, was pulled to, wound around the wooden knob, and sealed by the clay. The door stayed shut until the clay which soon hardened, was broken and the cord loosened. *The impression of the knobs, the cords and the wall-surface have been identified on the inner side of the broken clay lump.* The excavators say that this method of shutting the door and keeping a check on stores was very widespread between the end of the 4th and the beginning of the 2nd millennium B.C. in all complex urban societies, from the Peloponnese (Greek island) to India. Again there was a central open courtyard around which the rooms were arranged. This was also the practice in India. Access to the terrace was also from the courtyard by means of a staircase built up against one of the long walls.

Drainage

No arrangement for the drainage and sewage seem to have been made in the Eastern Residential Area. But owing to the increase in population, pottery pipes were laid in the Central Quarters in about 2500 B.C. These consisted of cylindrical segments, each measuring a metre in length and about 20 cm. in diameter. These fitted together at the ends and were laid in a clay course.

The piping system was technically well laid out, and seems to be a part of the huge public building, which unfortunately has not survived. But it is conjectured that this was either a administration building, or the residence of a chief.

While this much can be said for a part of the Eastern Residential Area, and the Central one during phase II, nothing much can be said for the earliest houses, except that these were single rooms, built more or less in the method seen later.

This urban settlement continued to expand even after 2500 B.C, until it encompassed a total surface area of 80 hectares. Not only the southern spurs of the plateau and the nothern hill slopes were inhabited, but about 25 villages had sprung up on the outskirts of the city, along the branches of the delta. This seems to have been revealed by the occurrence of a buff-coloured pottery with greenish tones. During this phase the Eastern Residential Area was slowly abandoned.

"Burnt Building"

Then came the end in about 2000 B.C., when owing to an armed conflict, the settlement on the Southeast and Northwest was burnt down. Of this the most outstanding evidence is a large architectural complex, known as the "Burnt Building." What the exact function of this building was cannot be guessed but it is presumed that it was a multi-family housing block where the various activities were coordinated by a sort of hierarchic structure. This inference is based on the fact that all the store-rooms are found in south wing, whereas a single room contains several ovens and only one blind room contains one millstand with basins for collecting flour.

The large size of the building is also suggested by the size of the doors which are more than 2m. high with a brick threshold. This building had an upper story, with a well-made flight of steps.

The End

The authors of this science-oriented excavation give a very unorthodox conclusion for the decline and the end of this largest urban settlement in eastern Iran, 4000 years ago. It was neither invasion (by Indo-Aryans), nor climatic changes such as gradual desertization, but the birth of a new type of settlement,—not a city—state or a city with dependencies, but a densely populated zone of small villages, irrigated by efficient canal systems and very much open to exchange with the nomad herdsman. This conclusion is supported by the fact that there is no decline in the quality of pottery, or metal working, or even building method. On the contrary the manufacture of the wheel-made pottery was widespread, as of other finished goods.

Here Shahr-i-Sokhta provides an excellent example of decentralization which we all wish today but this desert city had accomplished some 4000 years ago! Palaeopathology-study or insight into the prevelance of diseases in the past.

Some idea of the then prevailing diseases may now be had from the study of several skeletons found in the huge graveyard.

Over 80 percent of the skulls show a marked development of the horizontal muscles in comparison with what is normal in masseters and temporals and consequently greater wearing down of a helicoidal nature of the molars. One of the theories attributes this feature it the continual mastication of dried and fibrous kinds of meat.

Preservation of meat by drying, smoking and perhaps salting were in use in ancient Mesopotamia and Egypt and interestingly these processes are attested to by artistic representations and written accounts.

The use of such dried meat caused arthrosis.

It is also inferred that the people of Shahr-i-Sokhta were essentially pacific, because the study reveals no bone fracture, caused by weapons of war. The fractures of wrist and ankle are normally the result of agricultural activities.

Food

Some idea of the food eaten by inhabitants can be had from two large rubbish dumps, —one in the Eastern Residential Area, and the other in the Central Quarters of the city, and also from remains of excavated houses. Though the bones of sheep and goat are numerically more than those of the cow/ox, it is probable that the main source of meat-protein was from the latter. This was supplemented by that of fish, attested to by numerous fish bones, as well as fish hooks and remains of nets.

Additionally there was the meat of deer and onager but surprisingly no bones of wild boar have been found. This was no doubt present in the lake area.

Birds like the coot and pochard were also eaten. Fragments of numerous egg shell testify to the regular use of this source of food. And this could be found in abundance as many birds nest in the lake areas. While barley and club/wheat as well as linseed were cultivated seeds of Chenopodium album might have been collected wild. The flour obtained from these seeds is suitable for bread-making.

After a careful study the authors have been modest enough to say that the unlike the

Russians who after their excavation of Altyn Tepe could say that the craftsmen lived on hunting, while people in the city subsisted on domesticated animals, they could not make such a distinction because for want of such evidence.

Storage and Preservation of Food

Though no large granary has so far been located, it is maintained that centralized silos were used. While the excavators used floation technique not only for retrieving the evidence of cereals and other food stuffs, it is interesting to note, that they have also utilezed this technique for the presence of various kinds of insects which destroyed stored grain. They have noticed the remains of the Dermestidae, Plinidae.

More interesting is the discovery of "intricate pottery mouse trape which a guillotine type shutter." No doubt this is a vivid and direct piece of evidence of serious problem that the rodents constituted to the inhabitants of the city—und all over the world even today. Unfortunately this trap has not been illustrated. As far as my knowledge goes this would be the earliest mouse trap known and thought of at this early period.

The biochemists in collaboration with Professor Montenero of the University of Rome infer that the energy consumption of the inhabitants of Shahr-i Sokhta ranged from 2800 to 3500 calori per day. Of this 55-60% was formed by carbohydrates 22-30% by fats, 15-18% by proteins.

Floation Technique

Sudden drying up favoured the preservation of plant remains, found today in house remains, and silos, refuse pits, and graves.

Of the various manual and mechanical methods, best results were obtained by shifting each sample several times in water, using sieves with mesh of 2.1 and 0.5 mm. Fragments of leaves, stems, and numerous insect remains were collected.

While these were microscopic, there were also macroscopic fragments of burnt timber or of charcoal from fireplaces and kilns. Even unburnt, but preferably preserved wooden objects were found.

Vegetation

Some idea of vegetation in the immediate vicinity of the settlement may be had from central and southern part of the vast basin and the terminal lakes.

Aerial and satellite photos have revealed the position of Shahr-i Sokhta as being on the edge of the swampy lacustrine area, and this is supported by palaeo-botanical analysis.

This kind of data has supplied evidence for three kinds of environmental area; the terminal lakes, well watered delta areas, diaphragms and outlying areas.

The first viz. the lake region, which has now shifted its location 60 km. south of Shahr-i-Sokhta grew 5C00 years ago, as now plenty of reeds. This environment has been documented by numerous reed foragments (Phragmites), with visible traces of cutting and engraving.

There are also remains of Typha, Juncus and several others. On the river bank grew the poplar, willow, ash, elm, maple and tamarisk. Of these the poplar was used as roof-beams, and tamarisk for various purposes—including fuel. The poplar was also used for this purpose.

Among the plants cultivated between the river channels were Gramineae and Cucubritaceae, grape-wine and flax. It is indeed surprising that the seeds of wheat and barley have been found unburnt, and preserved by salt, in the pots from graves.

A single ear of *Triticum monococcum* was found intact in grave No. 110 while this is a primitive variety of wheat, more advanced, cultivated variety Hexaploid grain with seeds of two row barley were also found. All these are dated to C. 3000 B.C.

Still more advanced variety of wheat Triticum sphaerococcum is found only in Period III, c. 2500-2300 B.C. which is contemporary with the great Indus civilization.

There are several varieties of other grain, but represented in the excavation by very few specimens. As opposed to these, there is plenty of evidence for Chenopodiaceae. Numerous are the seeds of Cucurbitaceae.

Flax is the only plant found at Shahr-i-Sokhta which could have supplied oil as well as fibre. Interestingly, these seeds show a marked increase in size in the late phases.

Finally the environment was particularly favourable to the cultivation of grape-vine. In brief, the bio-archaeological evidence indicates existence of an extensive and fertile Oasis.

A number of communities lived in this region and exploited the area according to their traditional skill.

Fishing

Fishing was largely practised by the inhabitants, as can be proved by the large number of fish-hooks and fragments of fishing nets, and numerous fish-bones.

Birds

Numerous bird bones, found in excellent state of preservation, have enabled the ornithologists to identify 2614 bones. Though most of the birds are of aquatic species, there are also remains of sea coast pelicans, falcons, (eagles or Black Vultures).

As far as the reconstruction of the ecological environment is concerned, if the pelicans and falcons are excluded, for these are quite inedible there is the preponderance of Coots etc. which were hunted for food.

From the climatological view point, the avifauna substantially confirms the existence of climatic conditions of the type which are at present found in the central northern areas of Persia, close to the Caspian sea; Some species seem to be those of winter visitors to southern country. While some of the identified bird bones belong to species which do not form a part of the present day avi-fauna of Iran.

From the occurrence of wing parts of the eagle it is inferred that, as among the Hittites (C. 1500 B.C.), its wing was prized, and possible used for ritual purposes.

Likewise the cormorant which is quite unedible, might have been domesticated as it helps fishing.

Animals

The study of animal bones is equally thorough. Instead of merely listing the identification of the animals, the various specialists in cooperation with the excavators, have first selected about 2200 bones. Though on the whole these were in good condition, some had salt encrustation. The fauna represents eleven wild species, and six domestic forms. This might be regarded as small, but it is rightly pointed out that the climatic conditions in the region would not support a richer and more varied fauna. Secondly, and more important, Shahr-i Sokhta was an urban settlement, and naturally the inhabitants would largely depend upon domesticated animals.

Of the later 99% consists of zebu, goat and sheep. And among these though the majority of the bones are of goat and sheep, it is the zebu, which because of its large size would really supply protein to the inhabitants.

In the wild fauna, the absence of wild pig cannot be explained, because the site has yielded a very large number of animal figurines in Terracotta. And among these 60% are of the pig family, and of these with striped markings should belong to the wild species.

There are three species of rodents including the house mouse. The presence of otter (*Lutra lutra*) is due to the fact that this is a very attractive animal and was possibly liked by the inhabitants.

The dog was domesticated and kept as a house pet, as shown by the wide distrbution among the remains.

As far as the antiquity of the domesticated dog is concerned two specimens seem to belong to a species found at Cayonu, Southern Turkey. Other specimens are comparable with the later ones from sites in W. Asia.

The horse family is represented by a few bones of the onager, which in size was bigger than the present one.

The Persian guzelle is represented by 40 bone remains. This in size was not much different from the present one. The bones show clear signs of butchering and cooking. The camel is evidenced by skeletal parts, remains of the fleece and by camel dung.

The camel hair comes from a fragment of cloth and from a strip of fibre. Both are datable to C. 2700 B.C.

As far as the history of the camel is concerned, it is said that there is no trace of the camel in the Neolithic period in southern Turkmenia, but it appears in the 4th millennium B.C. This shows the growing state of cohabitation of the camel with man.

The sheep/goat and the zebu (ox) bred by the inhabitants were not different from those existing today in the region. These belong to the fat-tailed species. Among the zebu, most were of the humped variety (also shown by the majority of clay figurines). It appears that both the species were used for food and also as a draught animal, and for work in the fields.

At present the zebu is found only in the Himand basin and they have to go to the hills in times of draught.

Shells and their manufacture

Silvio Durante of the Italian Institute of Palaeontology, Rome contributes a very scholarly study of the numerous shells,—whole and fragmentary—as well as objects made out of these and comes to some important conclusions about the trade relations which Shahr-i-Sokhta had established with countries or regions where these conch-shells were produced, and the various methods which were employed in manufacturing objects.

There were two groups of shells. Shells like Polynices *mammilla L.*, Engina *mendicaria L.*, and two other most common variety of shells.

In the case of these shells the trade was regional, beginning with the supply area on coast to the inland settlements (Yahya, Bampur, Shahr-i-Sokhta). The second stage was the occasional and indirect, particularly with distant countries as Hissar and Anau in Iran and Central Asia.

In the case of Xancus pyrum, true Shankhas, a real trade relation with the Kathiwar coast and even Kanyakumari may be postulated. However, after importing the shells from these regions, they were worked on the spot. Finally of the four likely routes for this trades the author thinks that a land-route which could have liked the Harappan area to Sistan across the Gomal Valley, as most likely.

Stone Blade and Bead Industry

Grazia Maria Bulgarelli has presented an interesting and useful account of the stone-working Techniques and Bone Industry.

Like several Chalcolithic and Bronze/Age sites in India and elsewhere a large number of stone blades, cores, drills etc. were found, but because of careful, horizontal excavation of habitation sites and a part of the extensive graveyard, we not only have some insight into the various techniques of making beads but also unusual light on craft specialization. Further, as today, the makers of semiprecious stone beads meant for export purposes were concentrated in a limited area, as shown by the occurrence of micro-drill, while those who manufactured beads from local stones were spread all over the habitation areas, because cylindrical drills were found in several workshops.

Among the tool types, the largest number, 3125 were arrow-heads. Unfortunately all these were found on the surface. So we can neither have an idea of their technological development from period to period, nor their housewise distribution, so that we cannot infer, as we could for Navdatoli, in M.P. what part hunting played in the life of the people. Such a large number of arrow-heads does show that it played a major part.

Apart from this economic aspect what we should admire is their technical perfection. Most of the flint and chalcedony arrowheads have bifacially worked points. They are all made on flakes and blades with an accurate bifacial retouch. As opposed to

these the basalt arrow-heads have a rhomboidal section.

As far as the drills are concerned it was noticed that cylindrical drills were used for making seals and for perforating necklace-heads of local stone, while for perforating semi-precious stones, such as turquoise and lapis lazuli micro-drills were made from used blades. Again for these blades phtanite or light brown or grey flint was preferred. Probably all these drills were used on the principle of bow-drill and not continuous drills, as at Lothal, where a helicoidal bronze point has been found.

Though such a large number of finished tools of special categories or types—were found, it appears that simple flakes were not discarded. This is proved by the discovery of the only hafted tool. It is a small flint flake with a notch along the right-hand edge which is inserted in a globular shaped support of unbaked clay. The X-ray of the tool further showed that the flake was made to fit more tightly into the handle by wedging it with two small chips. The handle was made of impure clay. This indicates that this was a poor man's tool or very casually made.

Bone Tools

Only three types of bone tools were found. These include awls, and spatulae from long bones of sheep and goats, fish hooks, needles with eyes and open pipes made lengthwise from long bones of large birds.

Density of Population

Finally Lorenzo Costantini of the Botanical Institute of Rome, and Maurizio Tosi of the Oriental Institute, Naples discuss the density of the population of Shahr-i-Sokhta in relation to its natural resources. Here only their main conclusion can be cited. They say, "Shahr-i-Sokhta was a prehistoric capital of Sistan. The disproportionate size of this urban centre to those of any other settlement contemporary with it, is undeniable indication that there was maximum population density, and it was a highly developed economic centre. Whereas no village of the period was more than 4 (four) hectares, Shahr-i-Sokhta covered an area of 80 hectares, and its population would not be less than 8000."

The authors then proceed to consider how this was possible or had become possible from a larger point of view Shahr-i-Sokhta, like Mundigak, now in Afghanistan was the product of two great Afghan rivers, the chief amongst being the Helmand. Hence they would suggest the teım "Helmand Civilization" for this phenomenon. Not only the Helmand is the only perennial river between Mesopotamia and and Indus, it has certain geographical features which endow it an individuality. While there is and was a great potentiality for agriculture, there were pre-desert steppes, and terminal lakes.

Hence as today, this region of great environmental differences supported different kinds of population—agriculturist hunters, fishers, and cattle-herders, and lastly craftmen in the cites. Thus there was regional and functional division of labour. The city was naturally the focus of manufactured goods for regions far and around.

Thus with the help of several scientists, Dr. Tucci and his colleagues at ISMEO

have achieved a rare feat of bringing back to life a town burnt down in the Sistan desert some 4000 years ago (C. 2000 B.C.). Indeed, the legendary or traditional name "Burn city or "Shahr-i-Sokhta" truly epitomizes the history of no less 1500 years (C. 3500 B.C.-2000 B.C.), as did Tambavati (Copper City) does for Ahar near Udaipur. And this too was proved by our excavation in 1961-62.

Appendix II

Important Additions

Earliest Man (?)

When the first edition of this book was in the press, there appeared the news of the discovery of *Zinjanthropus* at Olduvai Gorge in Kenya (Tanzania). This important information was cited in a footnote.

In the same way, after the second revised edition of this was in the press, there appeared the news of the discovery of footprints of human-like creatures in Tanzania which are believed to be 36,000,00 years old. So far the full report has not been received and hence a brief note from *The Times of India* is quoted here.

Anthropologist Mary Leakey's discovery of 57 foot prints of two animals walking erect, unquestionably human-like, is of the utmost significance in the history of the evolution of man. The prints are more than 3.6 million years old and have been preserved because they were made on volcanic ash which, reacting to water, was in the process of solidifying like plaster. They were recently discovered in Laetolil, some 50 kilometres south of the famed Olduvai Gorge in Tanzania, long believed to be the birthplace of man.

Dr. Leakey is "75 per cent sure" the footprints were those of *Homo erectus*, those of a male and either a female or a child. From the size of the prints she has been able to judge the height of the protohumans: about 122 centimetres tall, which neatly fits into the calculated stature of early human ancestors. Part of the importance of this find is that this date (more than 3.6 million years ago) precedes by one and a half million years the earliest evidence of tool-making by man and of human brains larger than those of apes.

Use of Hand

From this we can deduce that the current theory that bipedalism or walking and striding erect as modern man does was more or less coincident with the use of hands and the growth of the brain is inaccurate. This hypothesis suggests that after man began to walk erect his hands were freed from the locomotion and hence he could devise tools. As biologist Bronowski put it, the "hand is the cutting edge of the mind." But was it really ?

Bipedalism preceded the free use of hands and brain growth by an extremely long period. This contradicts current theories. It should also be remembered that nomadic man became a domestic and social creature only some 10,000 years ago and that thanks to the genetic accident of the evolution of a short stemmed wheat grass hybrid.

Painted Grey Ware

Excavations at Jodhpur, District Jaipur, Rajasthan, yielded PGW. in Period III with iron objects, while the earliest period gave typical OCP with dishes-on-stand, and knobbed ware. Further the pottery had orange to deep red surface, and did not have traces of water-logging-powdery surface; the middle period yielded black-and red ware (bowls and dishes). This is said to be different from that of Copper Age Ahar black and red ware (*IAR*. 1971-72 (1978) p.28).

Kapilvastu—Piprahwa

Fresh excavations at Piprahwa, District Basti, U.P. yielded 31 terracotta sealings. These were inscribed in Brahmi characters of the 1st—2nd century A.D. On some the legend reads *Om Devaputra Vihar Kapilvastu Bhikshu Sanghasa*. Careful excavation of the stupa showed that it was thrice built, the earliest going to the Mauryan times.

Hence it has been thought that the site of Kapilvastu, Buddha's birthplace was in the immediate neighbourhood, and not in Nepal Terai (*IAR*. 1972-73, 1978. p. 33). Further in 1973-74 excavations the habitation site was discovered nearby. A large house with 16 rooms built in three phases was exposed. When this large house fell in ruins, monastic cells were built in two stages, around a central courtyard. Of all the seal impressions, the most remarkable is that on the lid of a pot (*IAR*., 1973-74, (1979) pp. 97-28, pls. XXXVII-VIII).

While this conclusion is probable, it might be argued that the sealings mention only that the Bhikshus belonged to the *sangha* from Kapilvastu, and does not necessarily suggest that the site where they were found was the site of Buddha's birth-place.

Mahurzari Excavations-1979

The Deccan College Department of Archaeology and the State Department of Archaeology, Maharashtra conducted excavations of the Stone Circles at Mahurzari in 1979. As

many as 9 Stone Circles ranging in diamenter between 4 mtr. and 17 mtr. were excavated. They yielded very interesting data and were found to have been exceptionally rich. The distinguishing feature of Mahurzari Stone Circles was that there was a lot of variation in the mode of burial. Whereas in some cases the dead was kept right on the murum along with pottery, iron and copper implements, in some others an oval pil roughly 2mx2m, was found to have been made to bury the dead. Secondly, the orientation was normally North—West, but East—West as well as NE—SW positions were also found. Thirdly, in one Stone Circle more than one body was buried. The maximum length of one of the skeleton at Mahurzari was 5'9". The dead comprised both males and females, who were all adults.

The Mahurzari Stone Circles were exceptionally rich as the funerary goods indicated. These included pottery, comprising the Megalithin Black—and—Red, the micaceous red and the coarse red, iron objects consisting of scores of axes with cross fasteners, dozens of long spikes, daggers, spears, knives, arrowheads and possibly swords; a dagger with iron blade and copper hilt; chisels of various types and shapes obviously for different purposes, frying pans and nail—parers of iron, lamps and ladles as also quite a range of bowls and dishes of copper equipped with tapering lids having a motif of birds, rams, buds and flowers. The most noteworthy feature of Mahurzari megaliths was the unmistakable evidence of the horse buried with the dead, practically in every circle. The evidence suggests that a fully caparisoned horse with iron belt, a number of ornaments made in copper for the face, the mane, the flanks and the back of the horse, was sacrificed and buried with the dead. Some of the horse bones show cut marks which support the observation made above.

Along with pottery, objects of copper, and of iron, and the horse, gold ornaments of the deceased were also buried with the dead.

It appears that some of the persons buried met with death because of weapons of offence, whereas some seem to have died in great agony. The former is suggested by the find of an arrow head inside the collar bone in one and a dagger blade inside the left ribs in another case.

The available evidence shows that the Vidarbha region was first habited by Megalithic people who possibly came from the Andhra region. So far, no evidence of pre-megalithic times has been recovered in this region.[1]

Fortifications

Excavations at Balirajagarh, District Madhubani, Bihar, showed that the original rampart height has been built in the late Mauryan period (*IAR*—1978-72 (1978), p. 7)

Likewise excavations at Asurgarh, District Kalahandi, Orissa proved that the earliest phase of fortification might belong to the Mauryan period, as it contained a piece of Chunar sandstone with typical Mauryan polish, besides pottery. (*IAR*, 1971-72 (1978), p. 26).

1 Information kindly supplied by Dr. S.B. Deo on 31.5.79.

Gudimallam Linga

Interesting, indeed unique features about this figure, were recently revealed, when excavations were conducted there in 1973-74. The temple—complex stands on a mound within the shrine of Parasuramesvarasvami shrine at Gudimallam, District Chittoor, Andhra Pradesh. When the rectangular *Pitha*, a later addition was removed, it was found that the figure was shrunken and had elephant legs. The *linga* shaft is square at the bottom and is fixed into two concentric rings of original platform (*pitha*) simulating the *yoni* of brownish sandstone with finely polished surfaces. A square rail 1.35 metre each side, reminiscent of that of the early phases at Mathura or Amaravati was found to run round this *linga* set-up.

From the stratigraphical evidence, and associated pottery (Black-and-Red ware) it is believed that *Siva-linga* with circular *Yoni-pitha* surrounded by the railing, was originally placed open to the sky, like the *Vriksha-Chaitya* of yore. It was something like a *savedika linga* coming into existence sometime in the second century B.C.[1].

Ramayana studies

During the last 25 years two or three important developments on new lines of study with regard to the Ramayana have taken place. First, the Oriental Institute of Baroda has brought out a complete Critical Edition of the *Ramayana*.

With a reliable text, it had now become comparatively easy to undertake a historical or more critical study of the epic. This the writer undertook. Two of his works *Archaeology and the Ramayana* (in Gujarati and Marathi) as well as *Ramayana, Myth or Reality* have been published. A much fuller study, entitled *Ramayana in a Historical Perspective* is in Press.

Side by side with this historical and archaeological study of the *Ramayana*, Professor B.B. Lal, at present Director, Institute of Advanced Studies. Simla has embarked upon the excavation of sites connected with the Ramayana. During the last four years he has excavated (1) Ayodhya, (2) Sringaverpur where Rama crossed the Ganga on his southward journey during the exile (3) Bharadvaja Ashram (near Allahabad), where Rama stayed before proceeding further south to Chitrakut.

"The most important outcome of the excavations of these sites, Professor Lal stressed, was that in their lower levels all these sites have yielded one and the same kind of material culture, a fact which clearly links up these sites, In this context he especially emphasised the importance of the excavations at Bhardwaja Ashram, near Anand Bhawan at Allahabad, where only two periods' occupation has been identified, the early one going back to about the eighth century B.C. and the later, with a break in between two, to the Gupta times. The Valmiki Ramayana, Professor Lal said, is generally thought to have been completed in the early centuries of the Christian era and the revival of the importance of this site in the Gupta period can thus be explained. He further added that if there was no basis for the Ramayana story how could a very

1 *IAR.*, 1973-74 (1979), pp. 1-2.

unassuming area like the Bhardwaja Park could yield the remains which go back to the eighth century B.C. He felt that there was quite a lot in our tradition which passed down from generation to generation through the word of mouth.

The location of the Bhardwaja Ashram is on the ancient bank of the Ganga and the material found indicates a temporary settlement such as one would expect in a hermitage on the bank of the river. Professor Lal added that the area at present known as Tagore Town is likely to be on the ancient bed of the Ganga.

Sringaverpur has a very impressive mound, more than 10 metres in height, situated on the bank of the Ganga. It is near this place that Rama is said to have stayed for a night before the Chief of the Nishads who inhabited this area, ferried him, Sita, and Lakshman across the river, from where they proceeded to the Bhardwaja Ashram. This mound has also yielded remains which are exactly similar to those found at Bhardwaja Ashram."

Index

ABBREVIATIONS USED IN THE INDEX

A—Ancient, B—Buddhist, C—Chalcolithic, Fn—Footnote, M—Mesolithic, Med—Mediaeval, P—Palaeolithic, Meg—Megalithic, N—Neolithic, PAK—Pakistan S—Site, T—Tribe.

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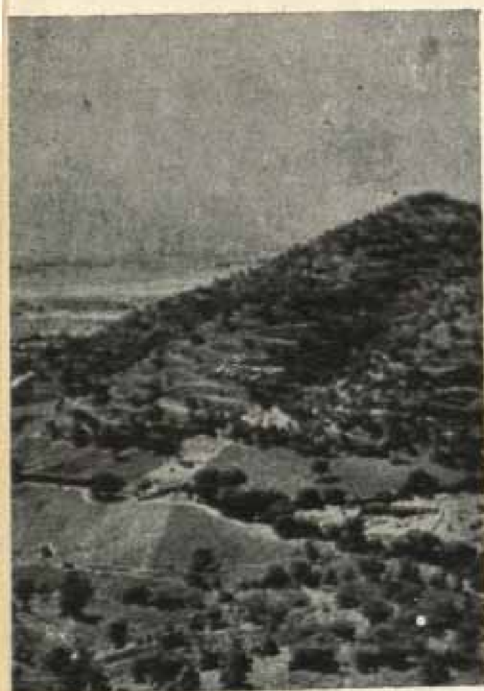
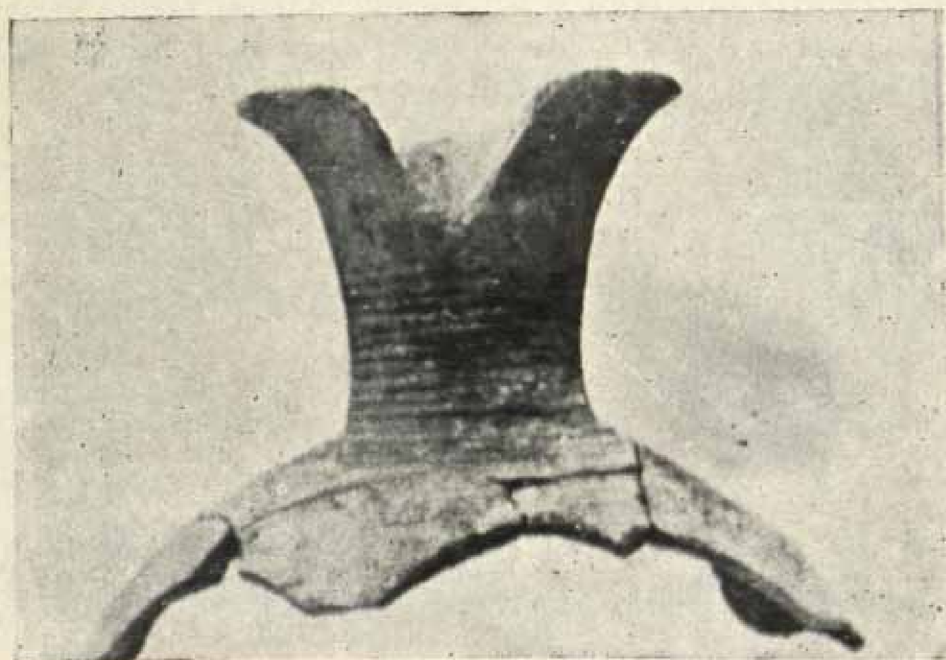




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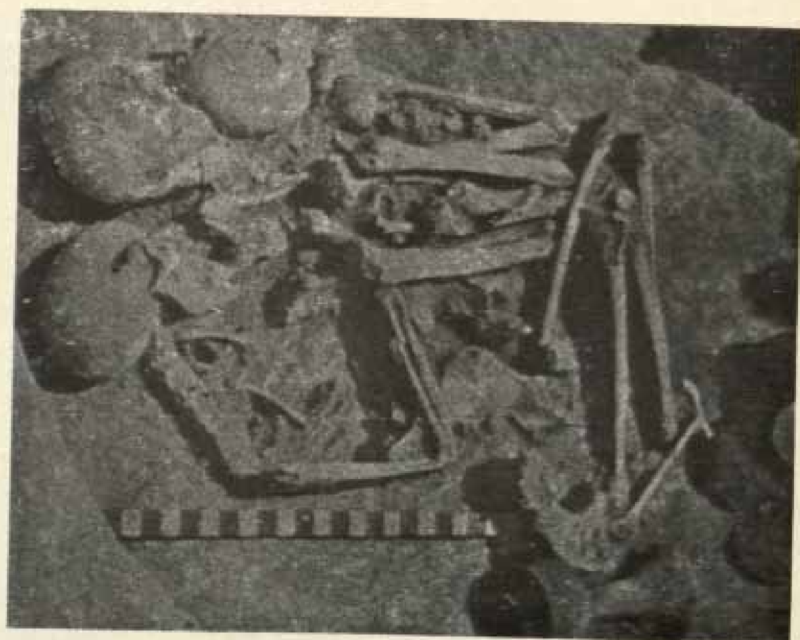
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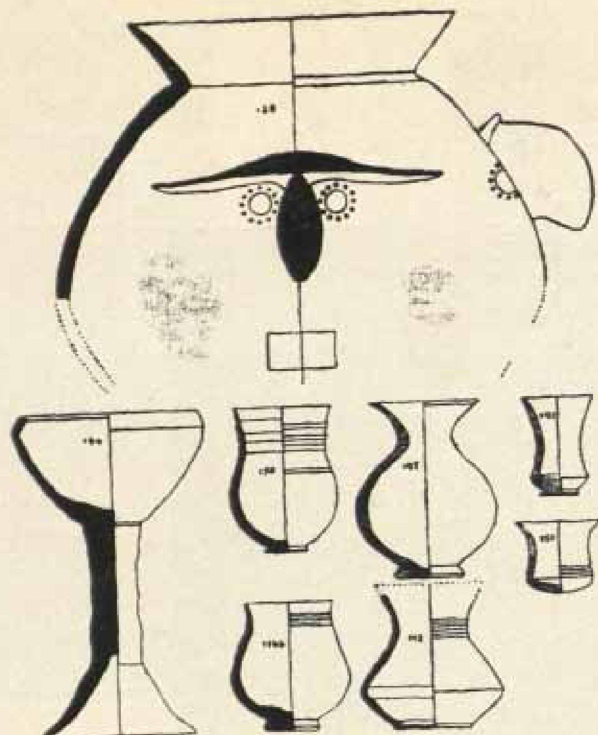
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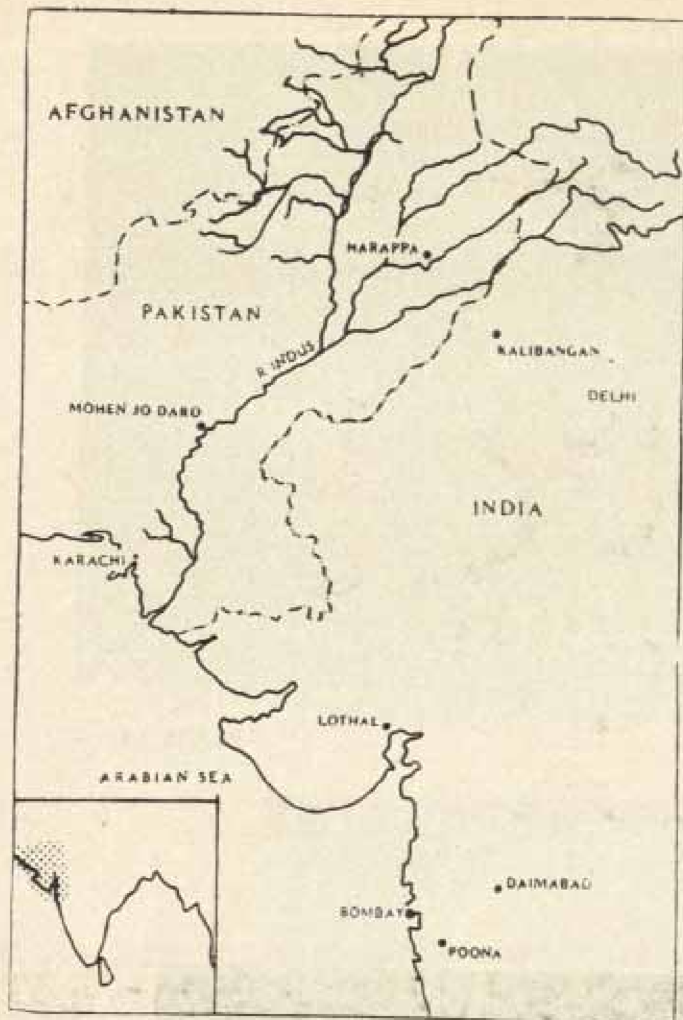


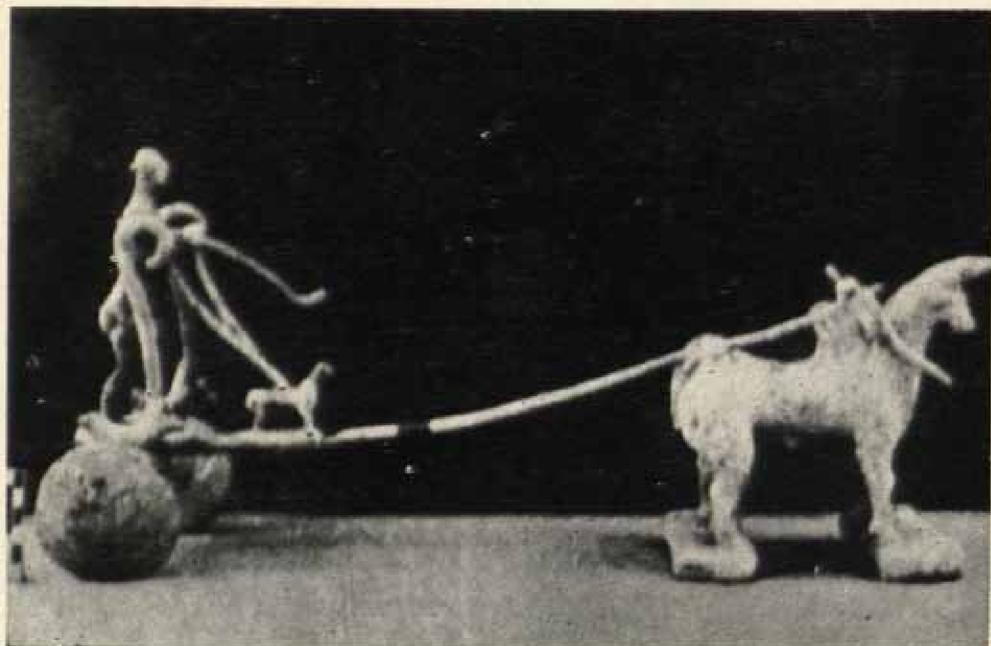
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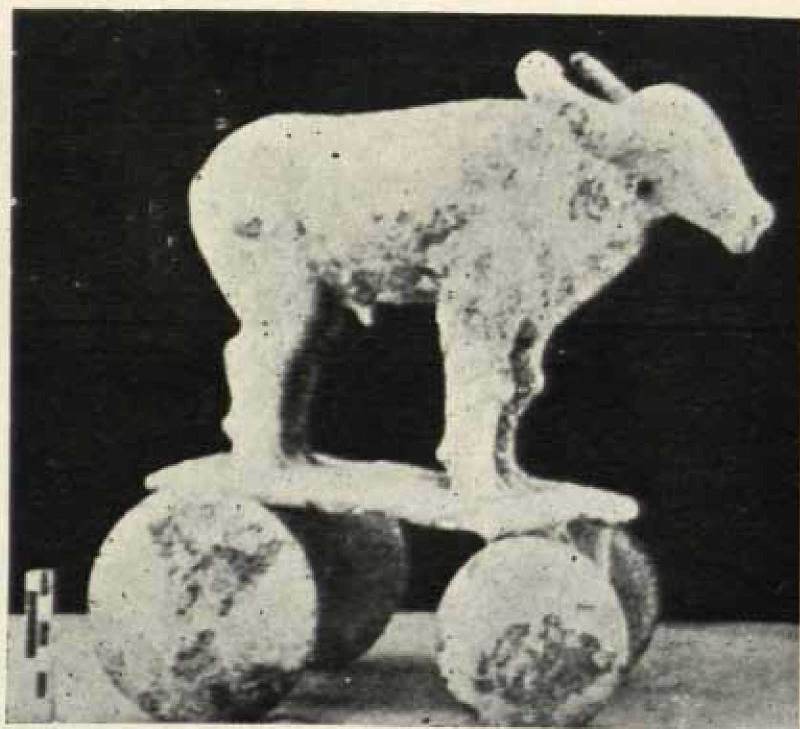
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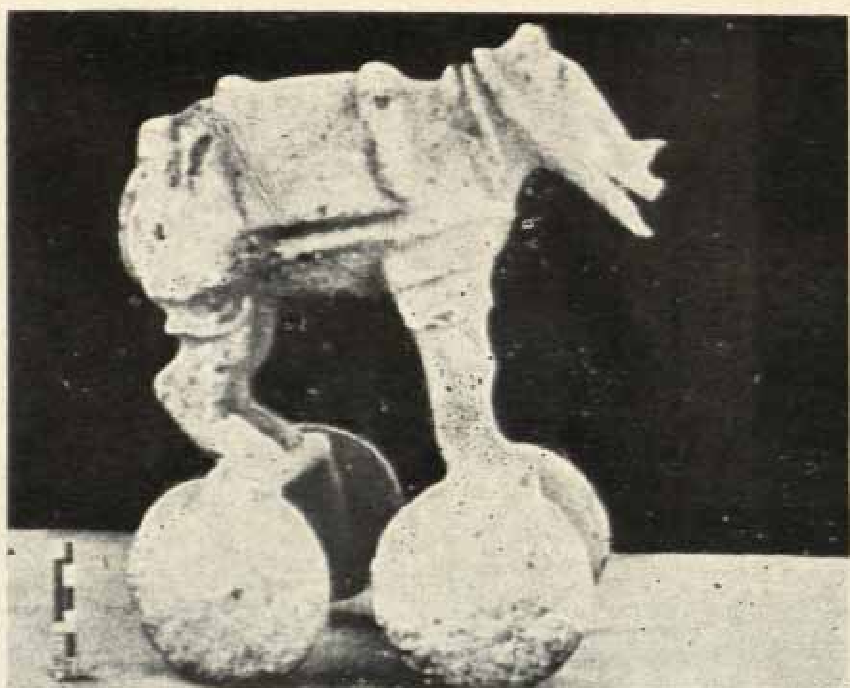
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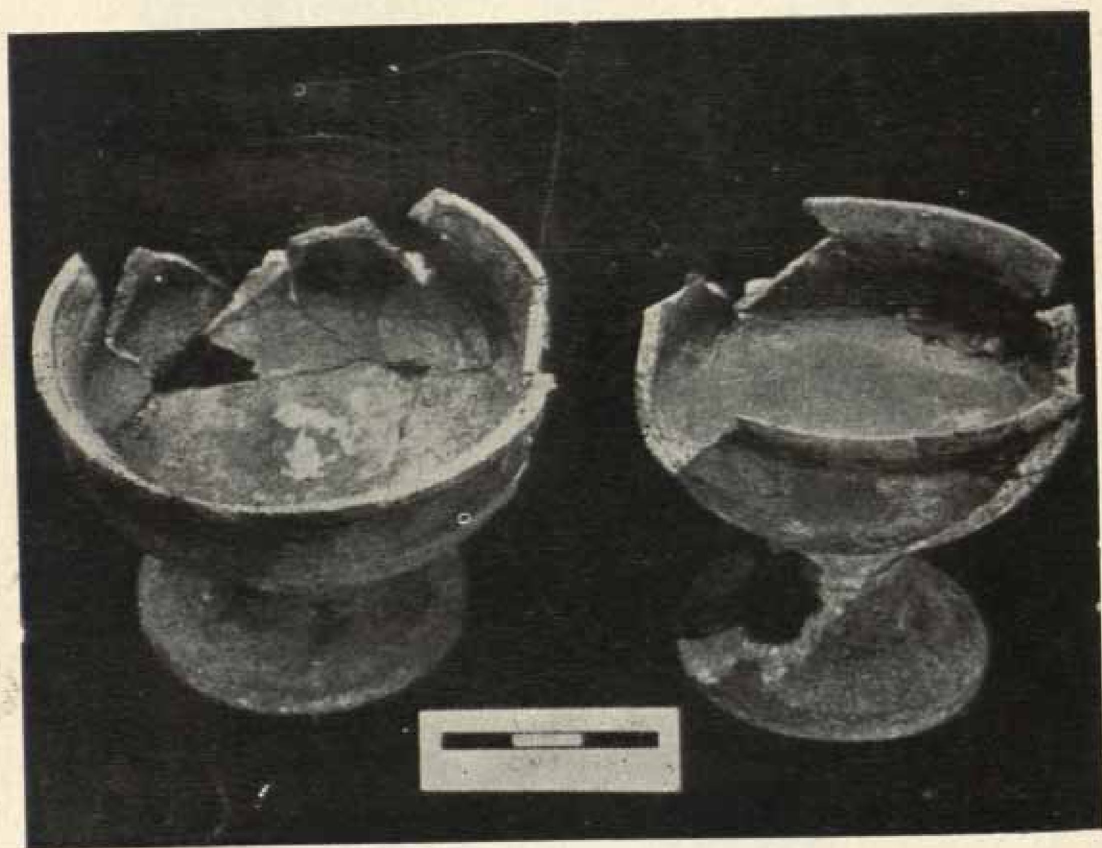
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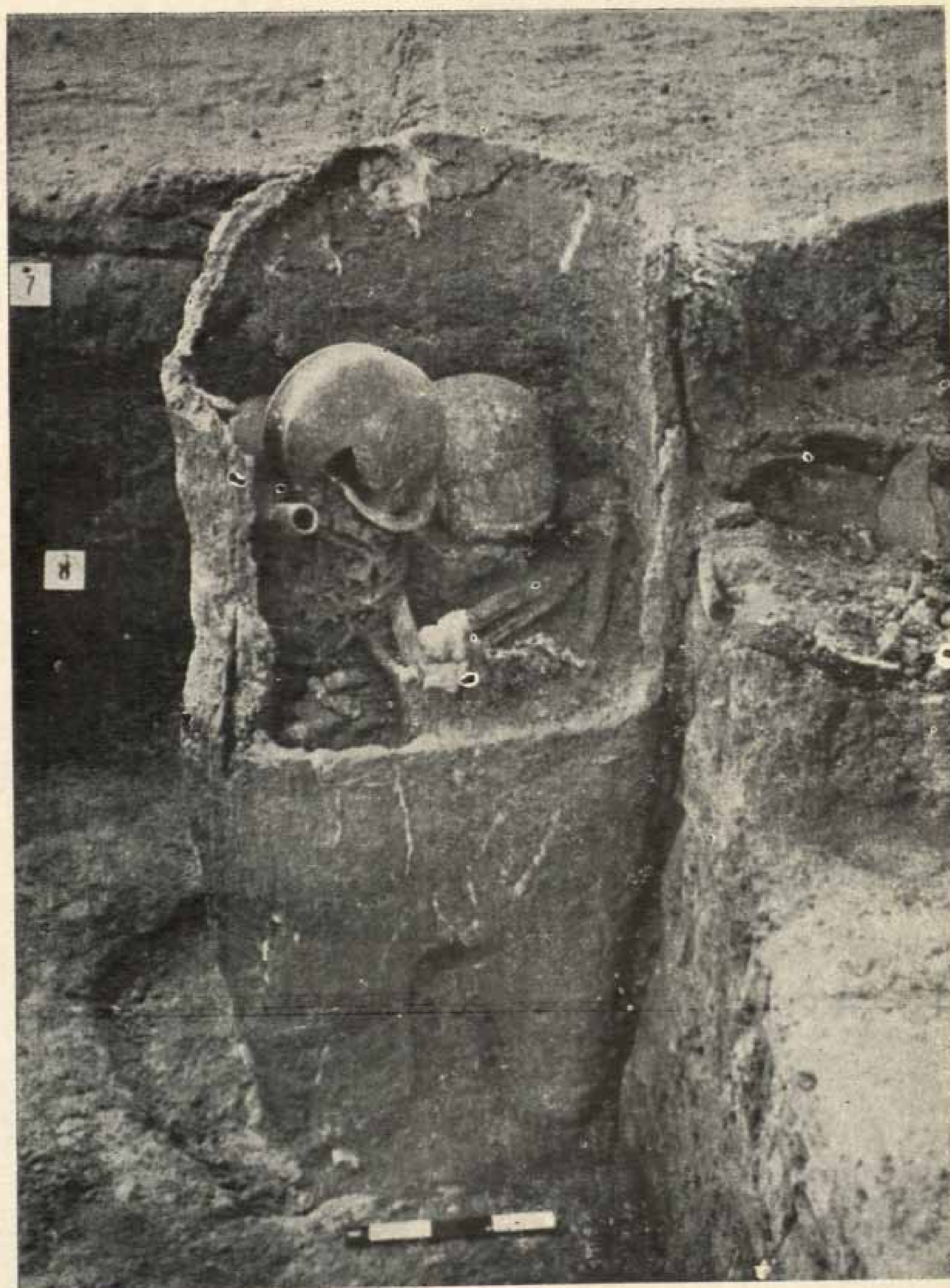


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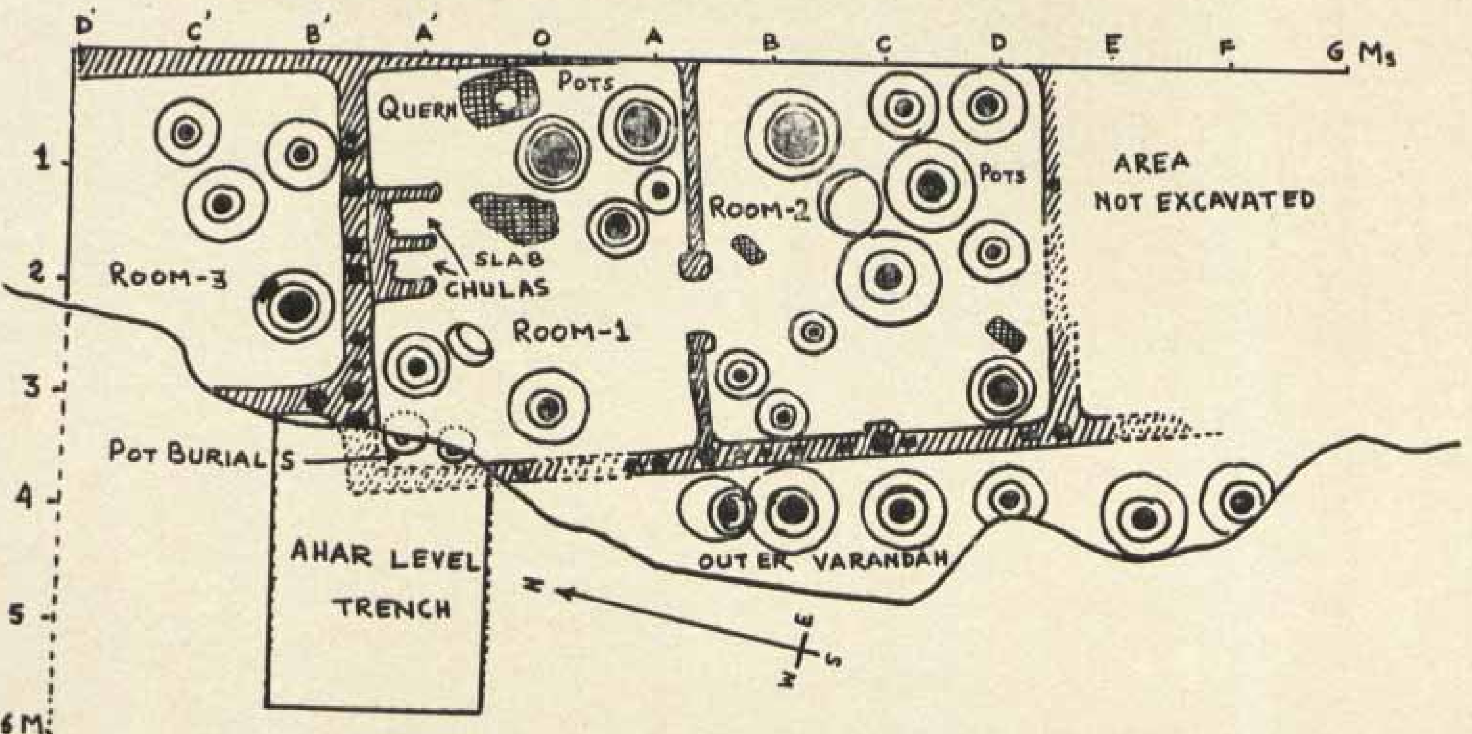
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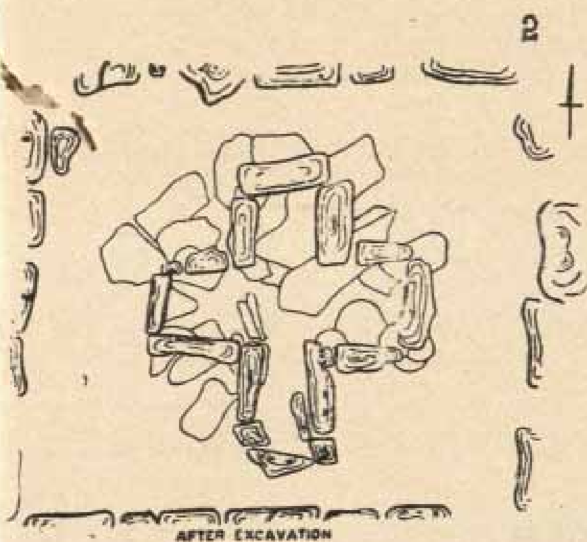
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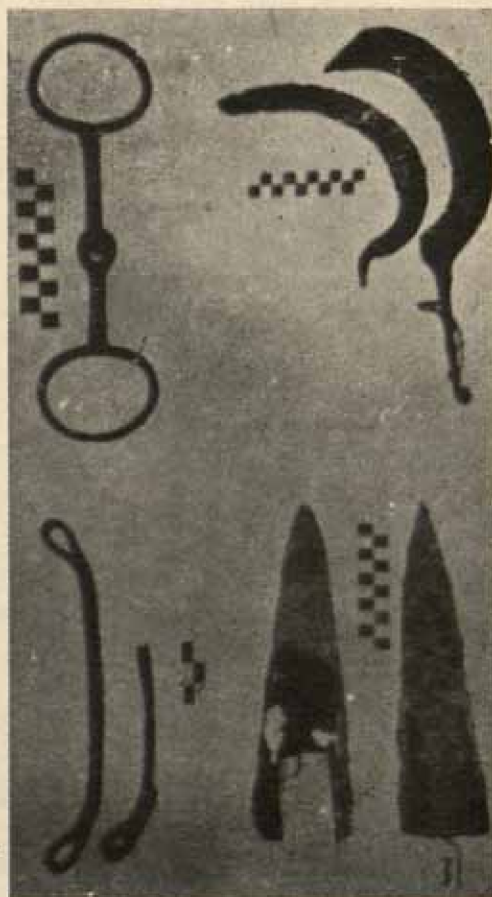


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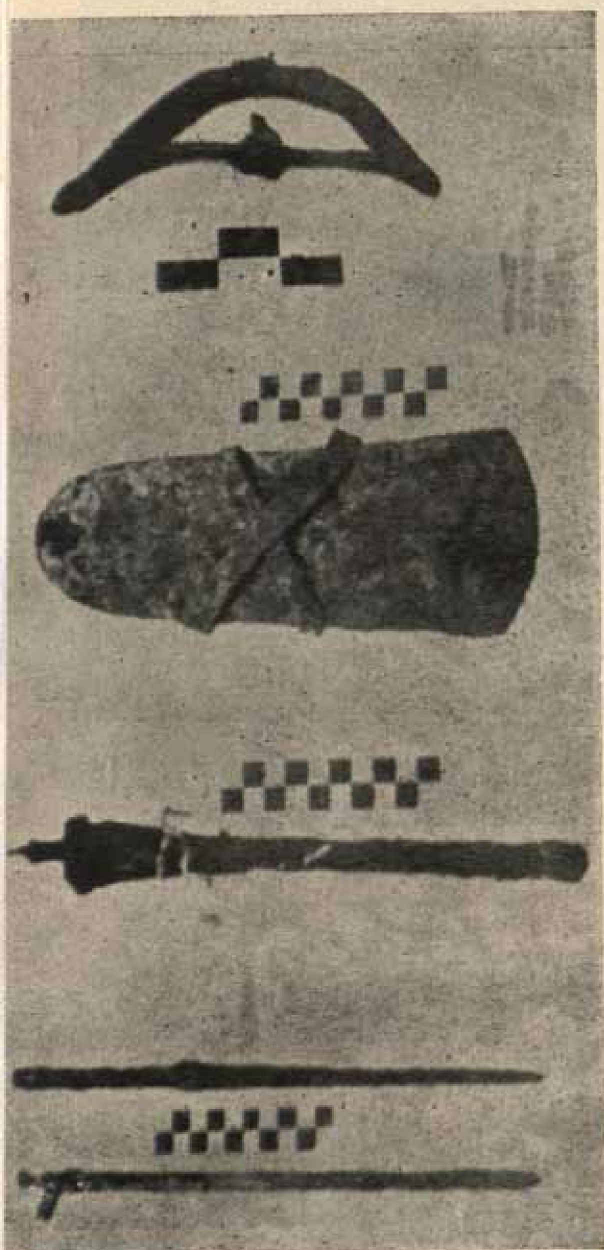


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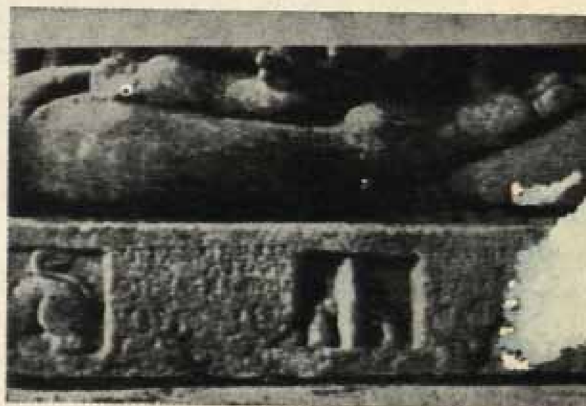
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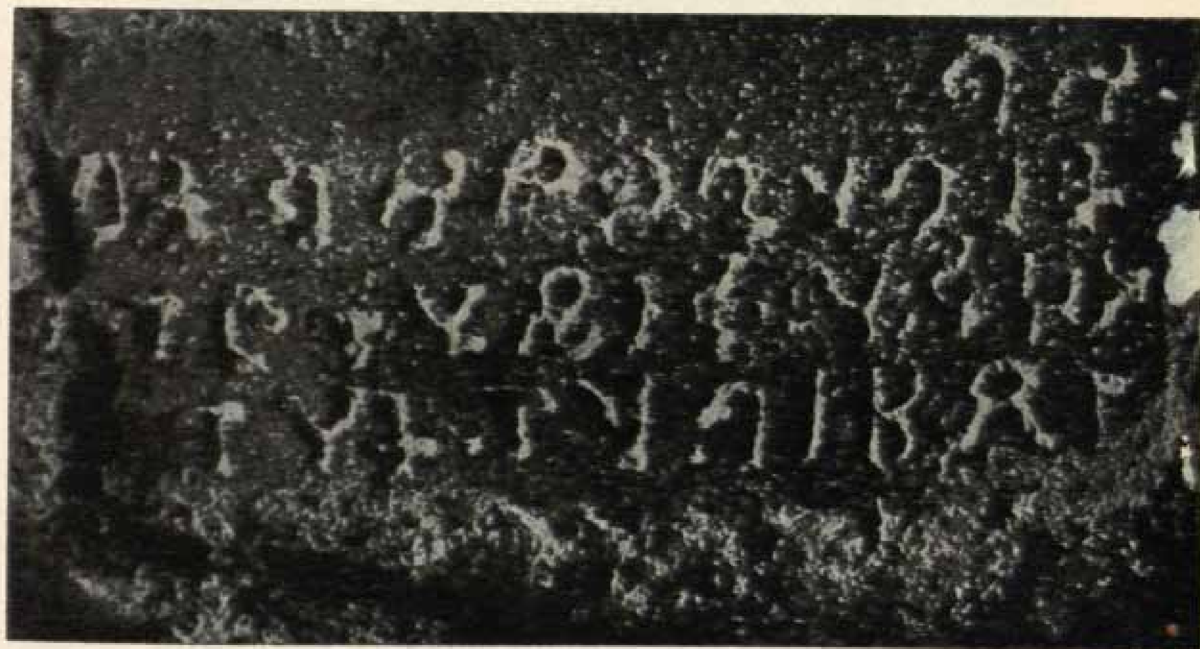


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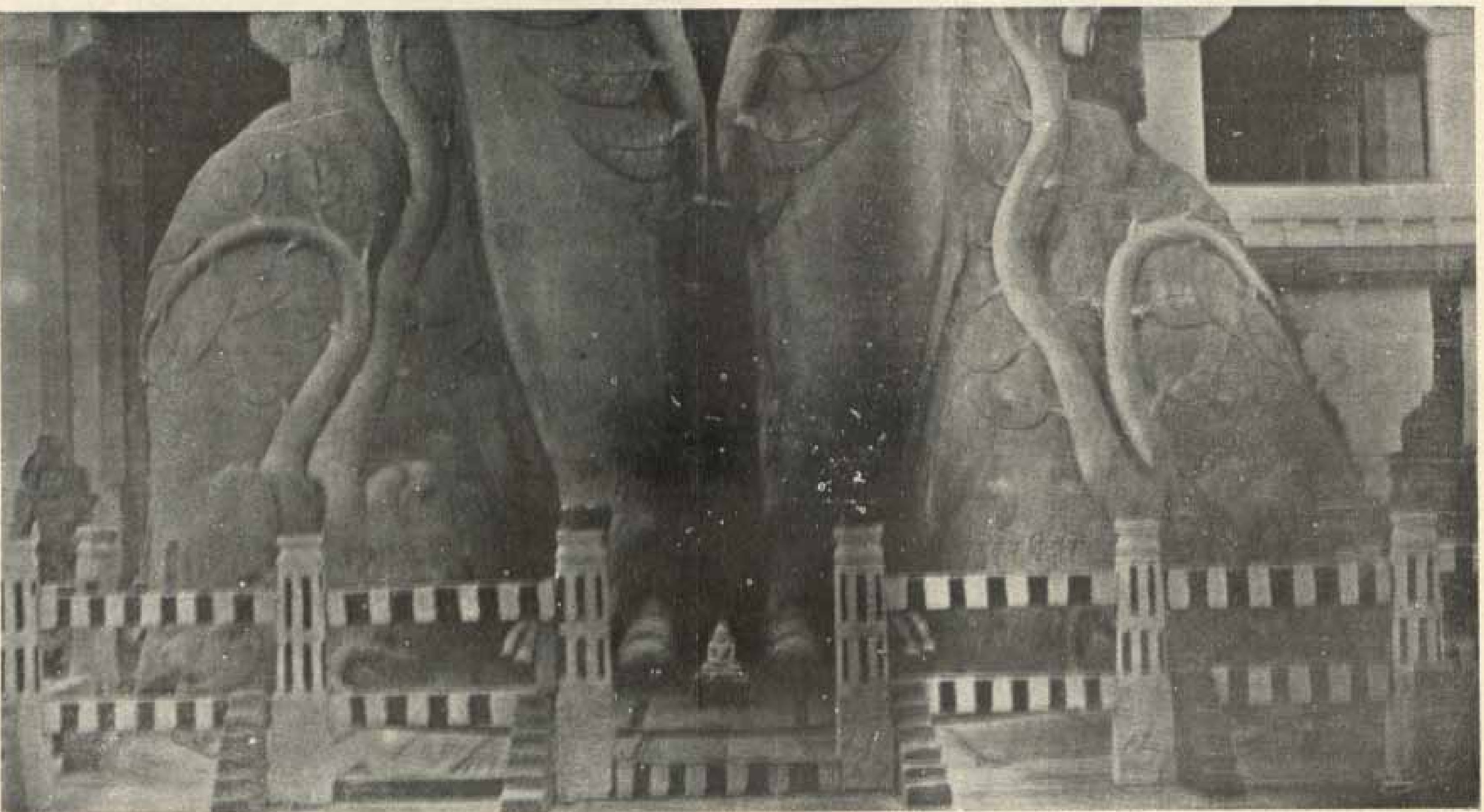
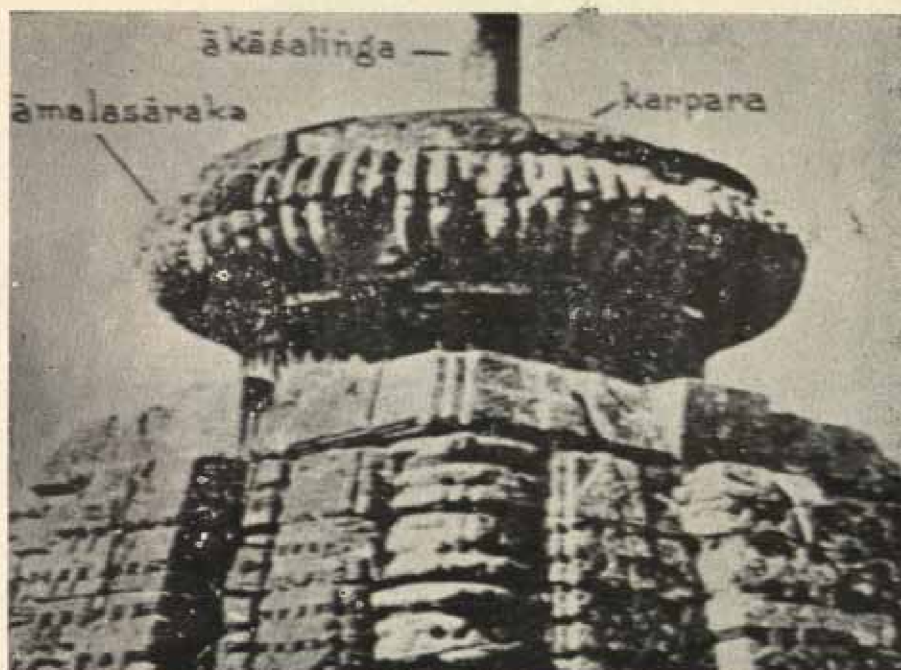
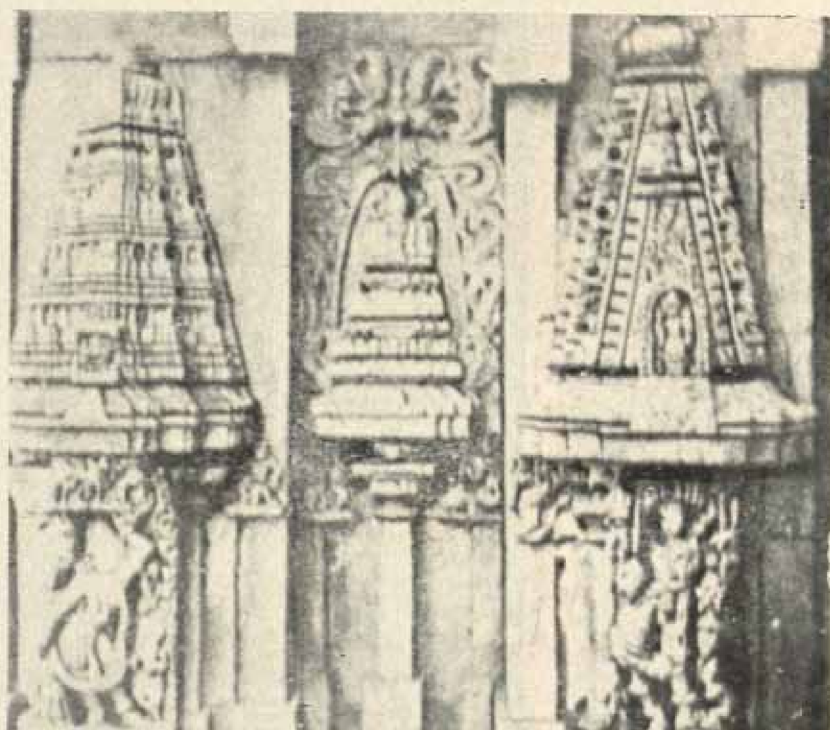


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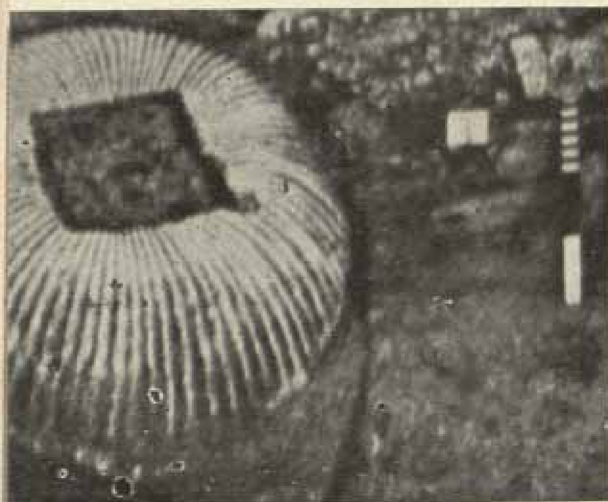
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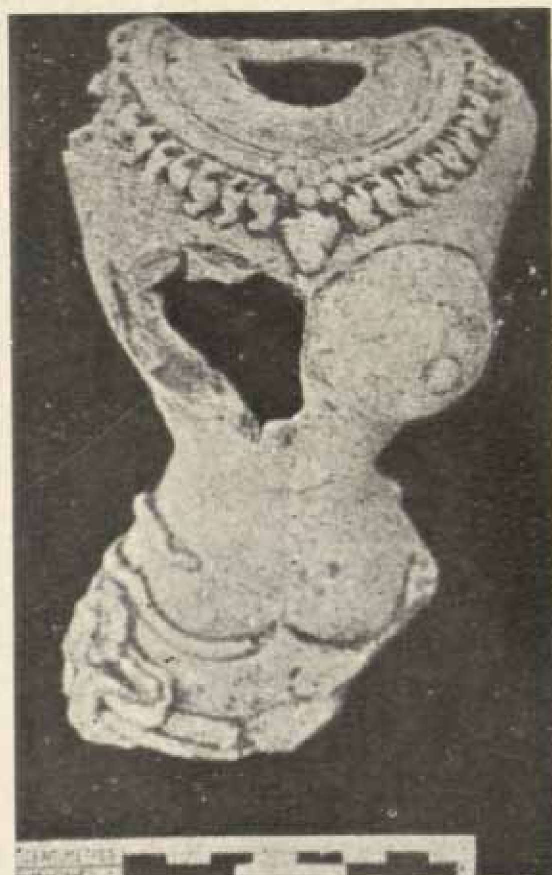
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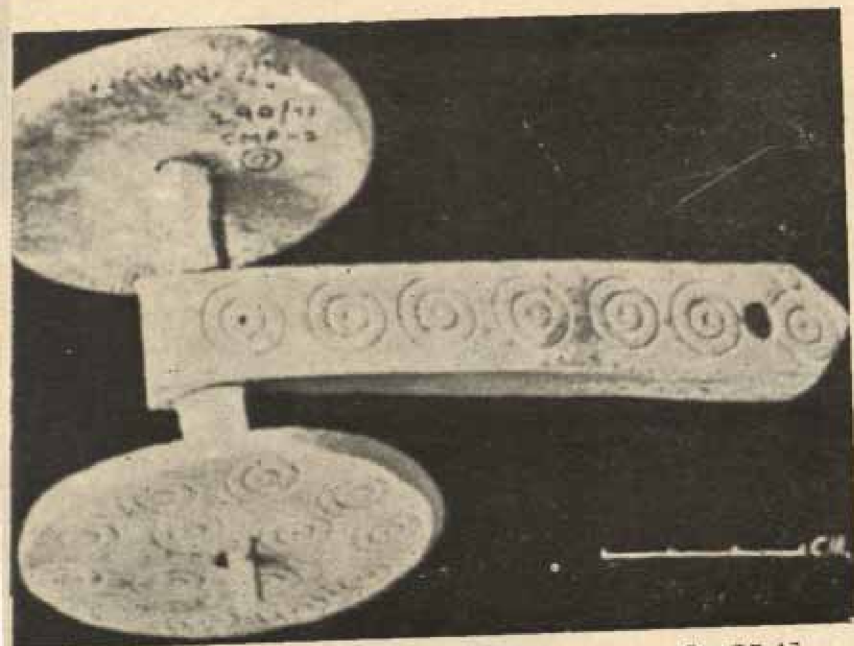
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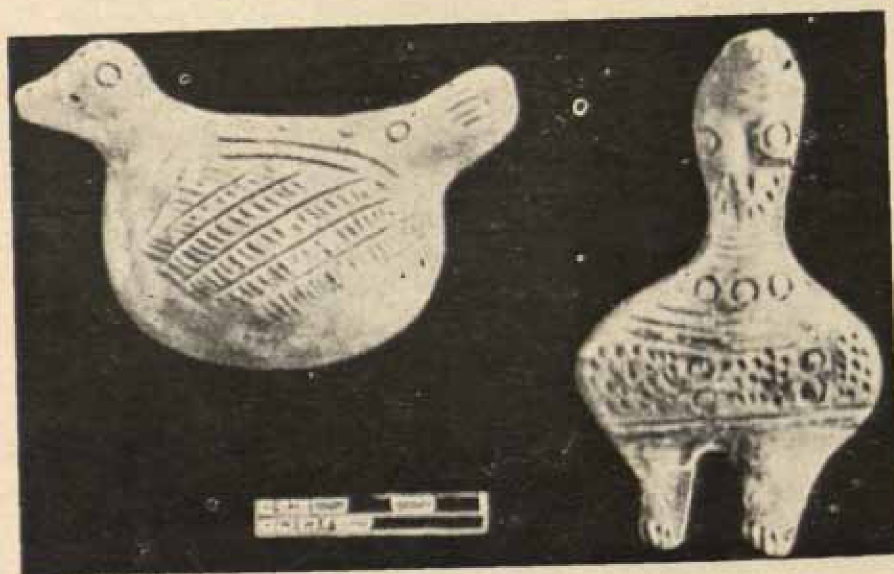


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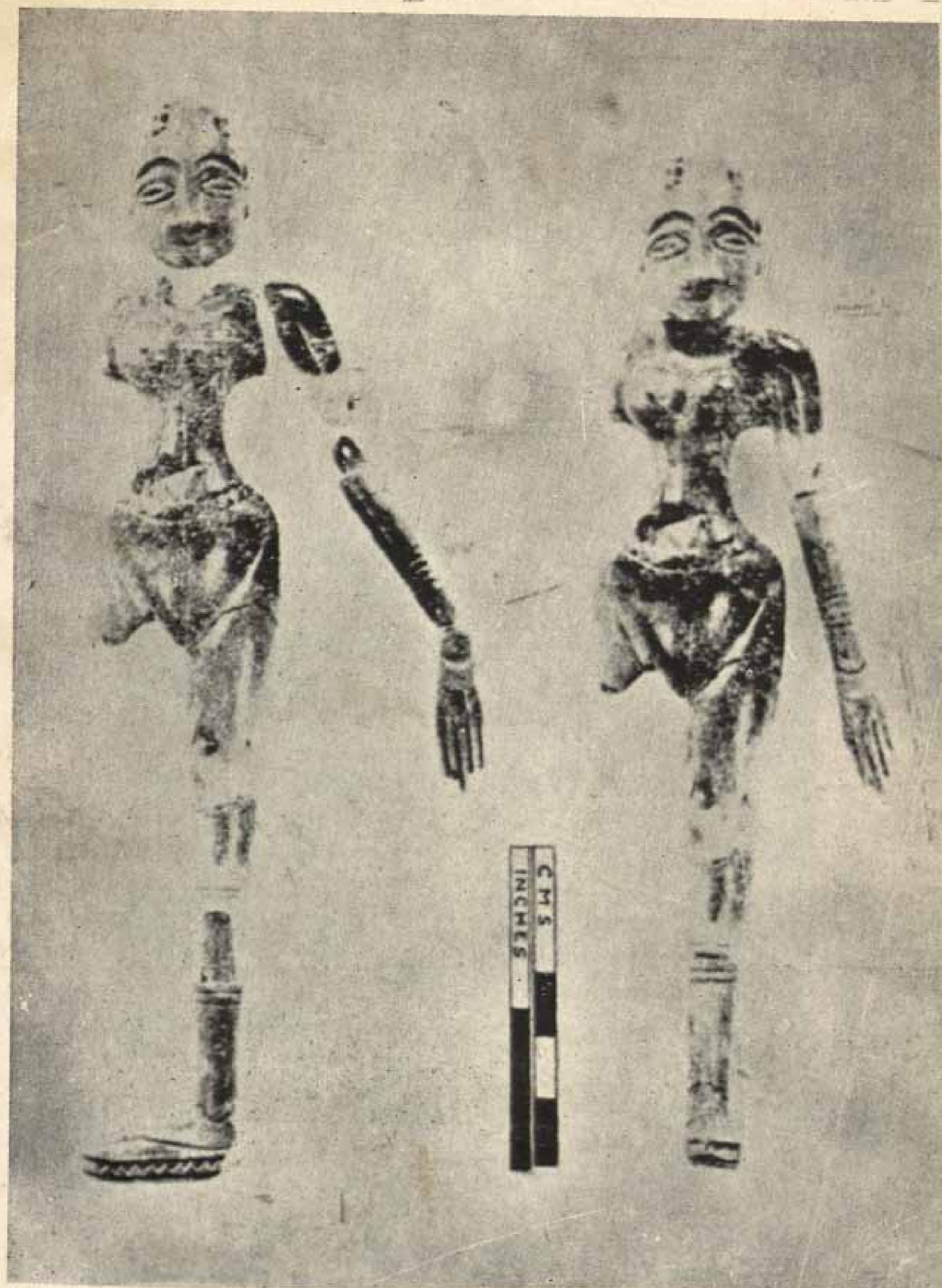
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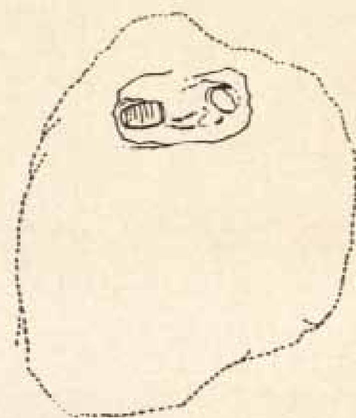
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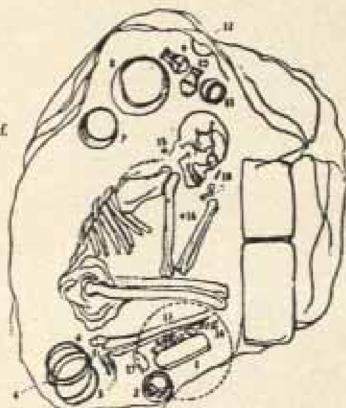
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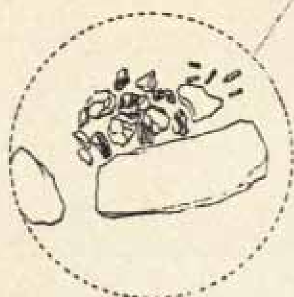


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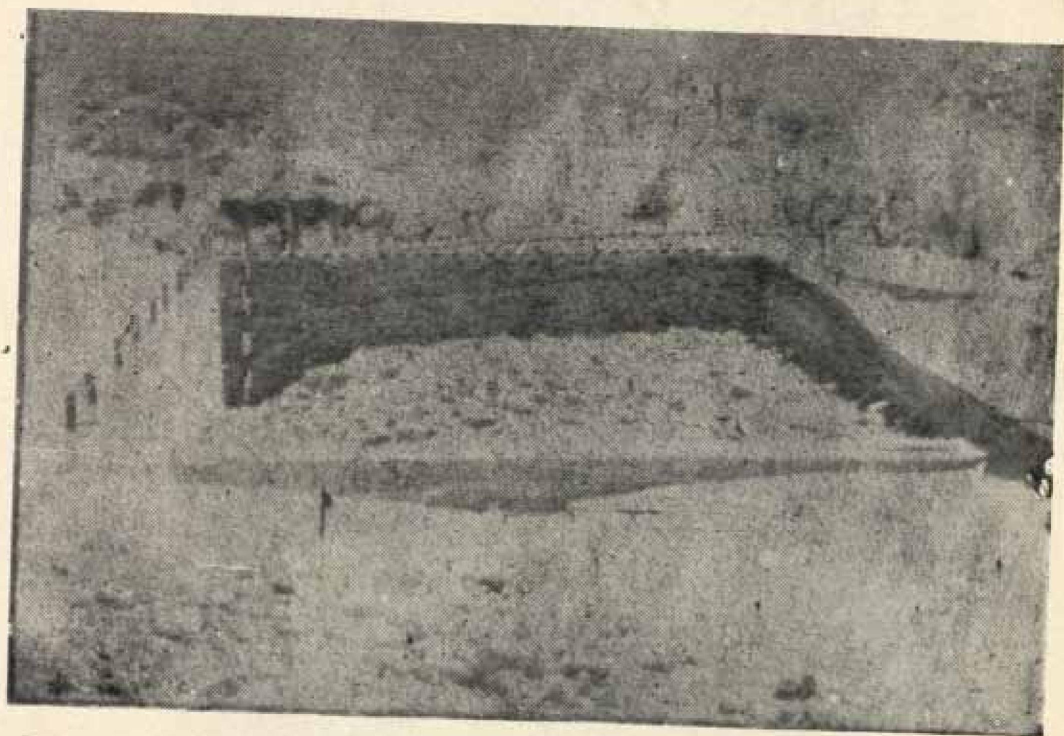


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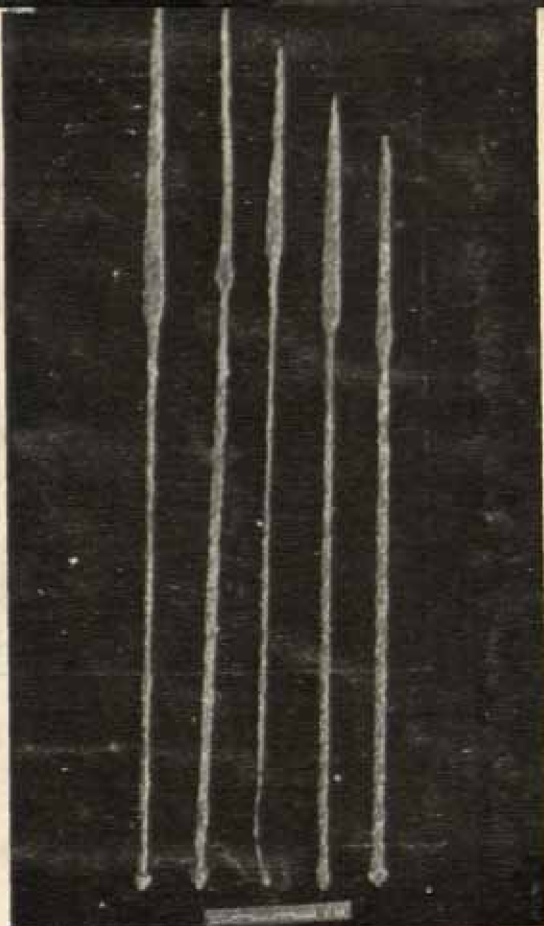
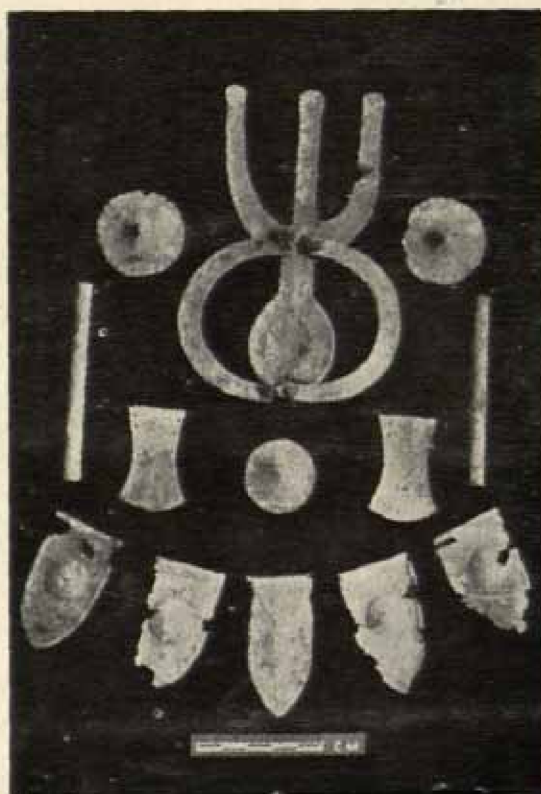


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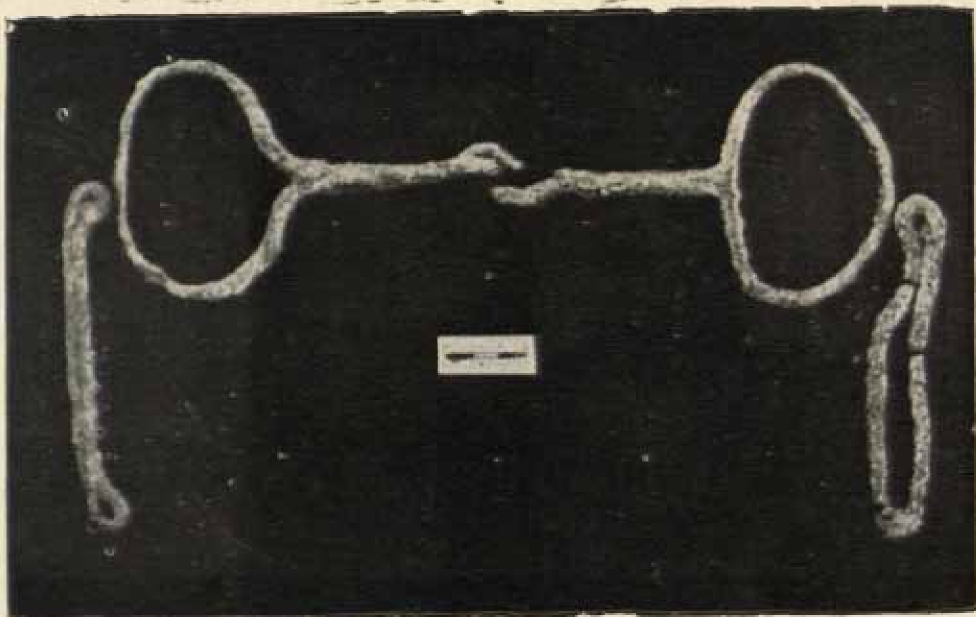


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